For producers of Sand and Gravel, Crushed Stone, Cement, Lime, Gypsum, and other nonmetallic minerals

DECEMBER 1957

PIT and QUARRY

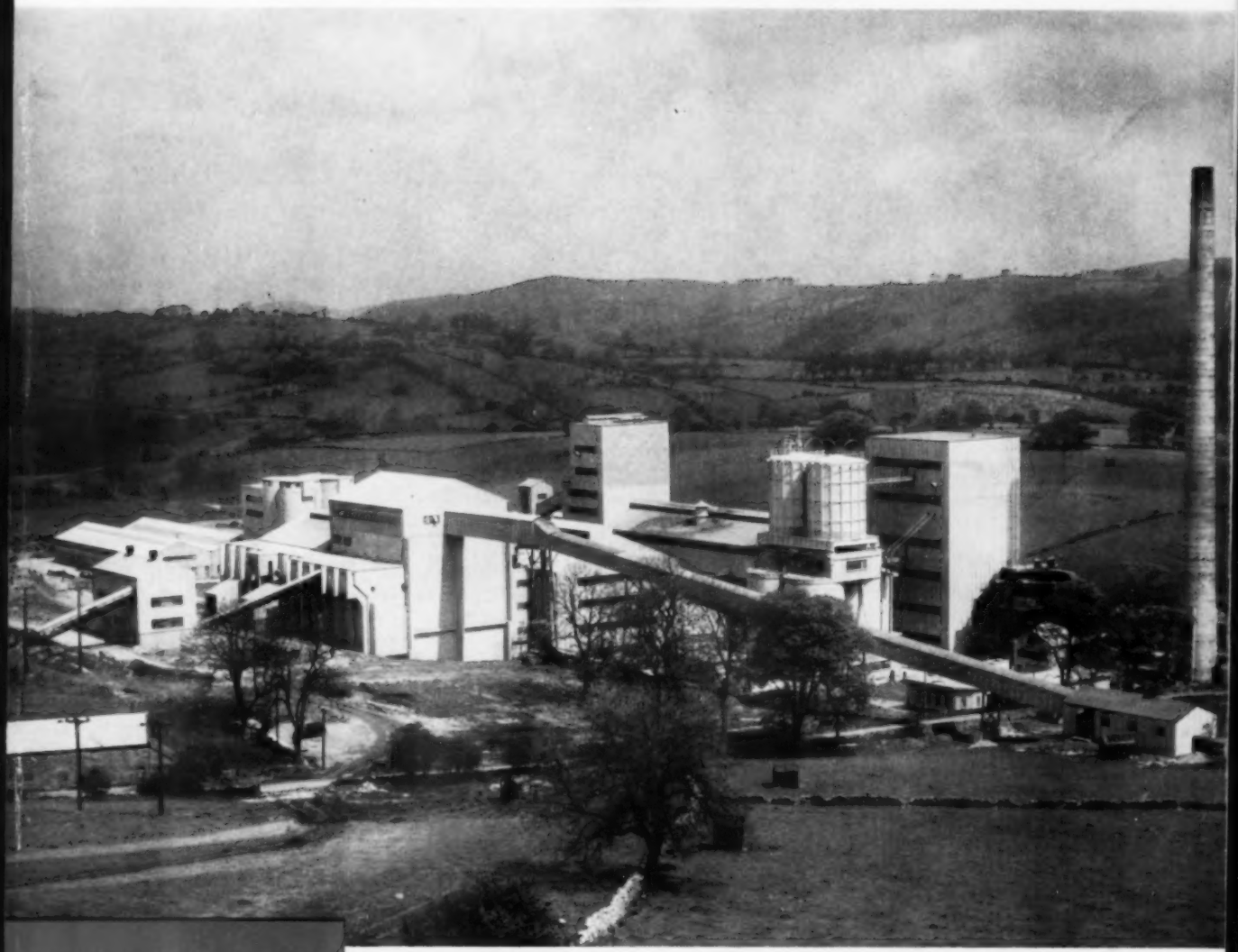
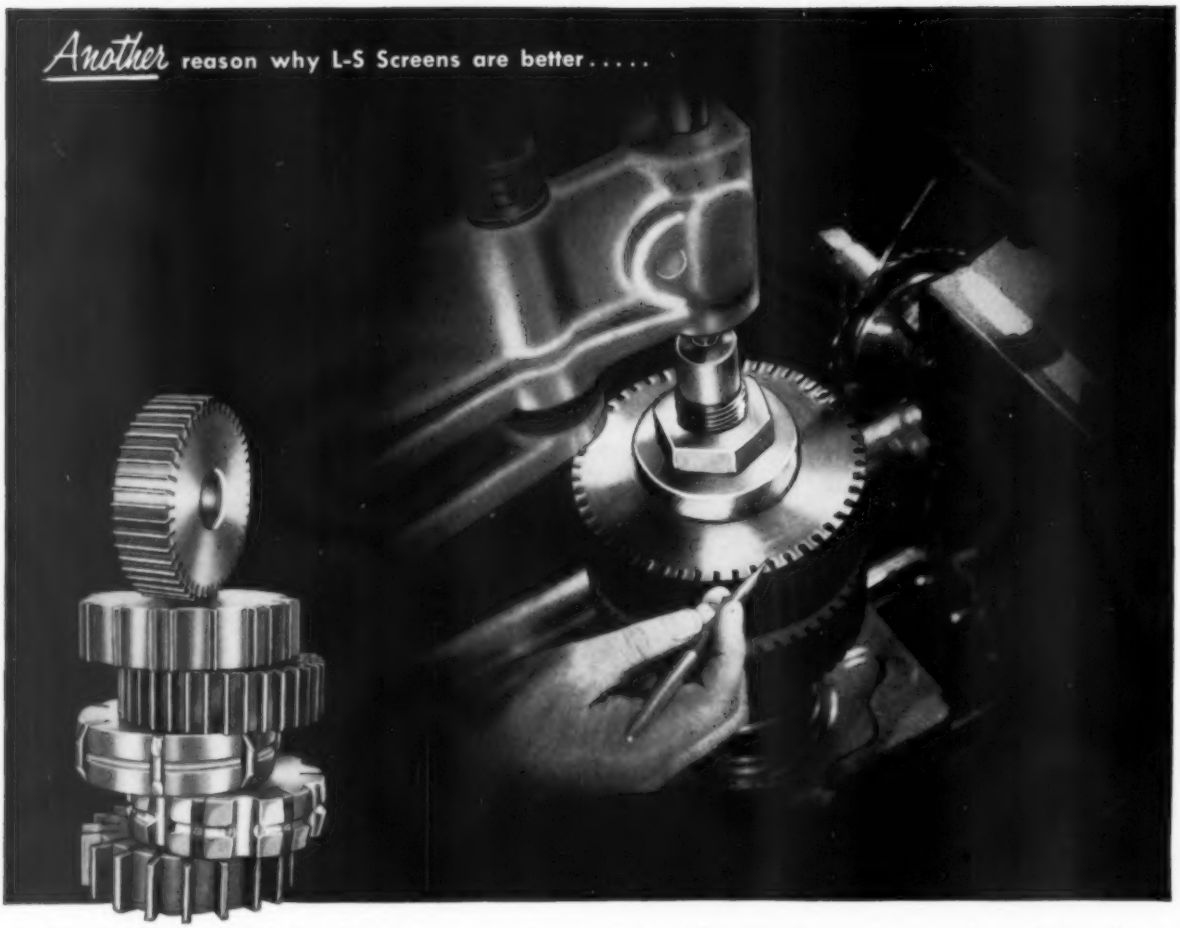
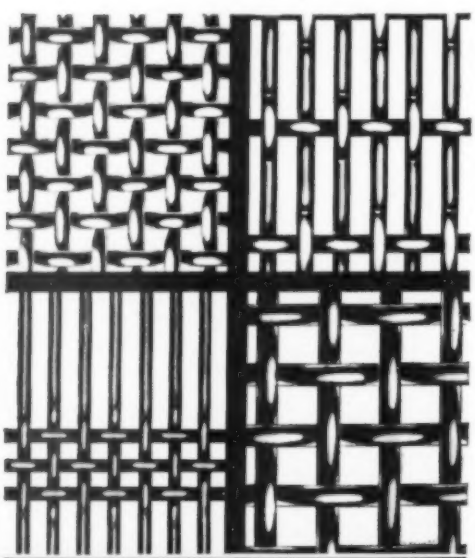


Table of Contents, Page 2

New Cauldon (England) Works of Blue Circle Group of Cement Companies. (See Page 119.)



LUDLOW-SAYLOR designs and makes its own wire crimping dies to insure precision weaving and dimensional stability



Ludlow-Saylor Screens and Wire Cloth can be furnished of stainless, oil-tempered, high-carbon, monel, bronze, copper, brass, or any other wire.

No guesswork here! It takes practical engineering knowledge of all the physical and chemical characteristics of many kinds of wire, production know-how and skillful tool-making ability, plus critical supervision to design and produce L-S wire crimping dies.

The care in crimping die production is typical of every phase of Ludlow-Saylor manufacture that makes L-S Super-Loy Screens tougher and stronger, more rigid and accurate. They wear longer, stand up better under every operating condition —yet cost no more than ordinary screens.

Specify L-S Screens to get a higher quality, more uniform, lower-cost product.

***Immediate Shipment* of most weaves and sizes**

Write for Condensed Screen Reference Catalog

Ludlow-Saylor

WIRE CLOTH COMPANY

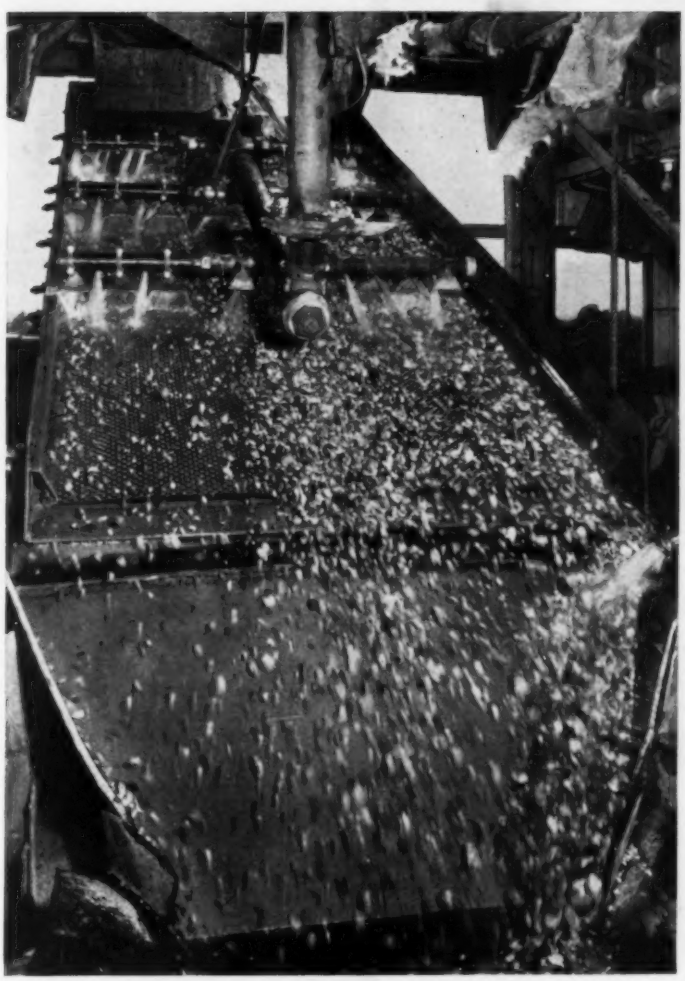
601 S. Newstead Ave. • St. Louis 10, Mo.

SINCE 1856

SALES OFFICES: Birmingham, 1727-6th Ave. N.; Chicago, 5708 W. Diversey; Pittsburgh, Union Trust Bldg.; Houston, 1213 Capitol Ave.; Denver, 1530 Carr St. WEST COAST SUBSIDIARY: Los Angeles, Star Wire Screen and Iron Works, Inc., 2515 San Fernando Road.

Want high-speed separation? Low-cost operation?

Size it with CA Concentric Action Vibrating Screens



IDEAL SIZING-WASHING COMBINATION. This sand and gravel plant uses Link-Belt non-clogging spray nozzles in combination with a triple-deck "CA" screen. Fast tumbling action exposes every particle for uniform rinsing.

Lively LINK-BELT screen stratifies beds fast—gives every particle maximum sizing opportunity

In the powerful Link-Belt vibrator shown above, you see the key to the fast, accurate, unfailing separation delivered by Link-Belt "Concentric Action" vibrating screens. Mounted in a unitized, extremely rigid deck assembly, this two-bearing vibrator is completely enclosed . . . incorporates unbalanced weights that are adjustable to the amplitude offering best balanced of speed and effectiveness. Frictionless labyrinth seals lock out dirt and abrasive dust from the vibrator housing . . . save maintenance troubles.

Designed specifically for medium- to heavy-duty screening needs, Link-Belt "CA" screens are fully described in Book 2554. Your Link-Belt office can furnish a copy, or write direct if you prefer.

LINK-BELT

VIBRATING SCREENS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,536

Choice of screen decks permits up to 3 simultaneous separations

PIT AND QUARRY, December, 1957, Vol. 50, No. 6. Published monthly by Pit and Quarry Publications, Inc., 431 South Dearborn St., Chicago 5, Ill. Subscription price $8 for 1 year in the U.S., possessions and Canada. Central and South America $10 for 1 year, elsewhere $15. Single Copy $.50 except $1 for January, May and July. Entered as second class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1879. Postmaster: Please send notices on Form 3578 and copies returned under label Form 3579 to 431 South Dearborn Street, Chicago 5, Ill.

pit and quarry

THE BASIC MAGAZINE IN A BASIC INDUSTRY

DECEMBER 1957 Vol. 50 No. 6

IN THIS ISSUE:

NBP EPA

EDITORIAL

Attend your Industry's Convention 10

PLANT

New 2,000-Hp. Clinker Mills in Canada Cement's Montreal East Plant . . . . . H. B. Howe 84

Interesting Features Installed at Cauldon Plant of Blue Circle Group 119

Sink/Float Beneficiation of Gravel Is Begun In Los Angeles Area . . . . . Harry F. Utley 132

Chemical Lime Company—First Large-Scale Commercial Lime Producer in Oregon . . . . . Harry F. Utley 144

ASSOCIATIONS

National Agricultural Limestone Institute Convention Program 32

N.I.S.A. Convention Features Important Committee Meetings and Reports . . . . . Walter E. Trauffer 98

Joint Meeting of Mining Society with Southeastern Mining Conference 103

N.L.A. Operators' Meeting Held at Austin, Texas . . . . . Buren C. Herod 107

SAFETY

National Lime Association Lists 1956 Safety Winners 73

Bell Mine of Warner Co. Winner in 1956 N.C.S.A. Safety Contest 82

Two Buffalo Slag Company Plants Win N.S.A. Safety Contest Honors 137

N.S.G.A. Safety Contest Winners Cited in Third Annual Event . 142

PROMOTION

Iowa Aglime Group Poised with 1958 Billboard Program 146

LEGISLATIVE

Washington News Letter . . . . . S. Herbert Unterberger 12

LABOR

Labor Developments . . . . . S. Herbert Unterberger 68

OTHER

Counter-Cyclone Unit Designed to Produce Clinker in Minutes . . . . . J. C. Witt 96

DEPARTMENTS

News of the Industry 23

Coming Events 23

New Machinery 52

Screenings 76

More Information Please 139

Legal Decisions 152

Manufacturers' News 158

Index to Advertisers 192

Cover Picture

• On the front cover of this issue is a picture of a new cement plant in England which is described by its owners as one of the most efficient plants in existence. This claim seems to be substantiated by the fact that this operation includes such features as a quadrant blending system, a Lepol grate-type kiln, and vertical raw material drying and grinding mills. The Cauldon plant is the latest addition to the Blue Circle Group of Companies, which operate 28 cement plants in Great Britain and 20 overseas. This plant is completely described in this issue. (See page 119.)

Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals.

Copyright 1957 by Pit and Quarry Publications, Inc.,

431 S. Dearborn Street, Chicago 5, Illinois. PIT AND QUARRY magazine was founded by H. W. Baumgartner, October, 1916.

To subscribers: When requesting change of address, kindly send old as well as new address.

PIT AND QUARRY IS INDEXED IN THE ENGINEERING INDEX

DENVER-DILLON Vibrating SCREENS

2-Bearing, Spring-mounted Construction Assures Higher Capacity, Longer Parts Life— and Cuts Horsepower up to 50%

LOW POWER REQUIRED. Weight of screen and material being screened supported entirely on spring-mounted suspension rods. Only weight on the bearings is the vibrating mechanisms. Bearings are not subjected to shock loads. Horsepower needed cut up to 50%.

NO DAMPING UNDER LOADS. Entire mechanism is free floating—not tied to supporting framework through outboard bearings. No damping even under heaviest loads. Efficiency remains high and constant.

UNIFORM VIBRATION—HIGHER CAPACITY. Full-Floating mechanism transmits uniform TRUE CIRCLE vibration to every part of screen. No dead spots. Constant, full-screen efficiency gives highest capacity and longest screen life.

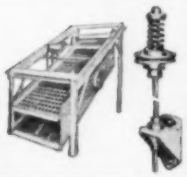
SAVES COST—SAVES SPACE. Elimination of unnecessary parts—heavy outer bearings and frames—reduces overall weight of Denver-Dillon Vibrating Screens by 30% to 50%. Width is considerably reduced. Cost is lower—space requirements are lower—than for 4-bearing types.

Distinctive Features:

Only 2 Bearings

Floating Circle Action

Suspended Construction



IN STOCK FOR QUICK DELIVERY

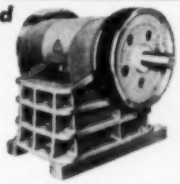
On hand is a wide range of Standard Denver-Dillon Vibrating Screens to assure you quick delivery.

Available in double deck types, either floor mounted or with suspension frame, sizes from 1′ x 3′ to 6′ x 14′—or special types to meet individual needs—there's a Denver-Dillon Screen to answer your screen problems.

Find out how a Denver-Dillon can cut your screening costs, increase your profits. Write, wire or phone. Flowsheets for every screening job on request. Ask for Bulletin S3 B15.

DENVER *Forced-Feed* JAW CRUSHERS

IN STOCK



Denver forced-feed crushers have anti-friction pitman and side bearings. Cast steel frame on 10" by 20" and smaller sizes, welded steel frame on larger sizes to 36" x 48". Jaw plates can be inverted for longer wear. Forced feed plus extra long jaws assure highest capacity.

C. A. Richardson, DECO Sales Engineer, is available to assist you with your screening problems. You will appreciate prompt attention to the details which are essential to your satisfaction. Write today!

"The firm that makes its friends happier, healthier and wealthier"

DECO ENGINEER — DENVER EQUIPMENT 24 HOUR SERVICE COMPANY

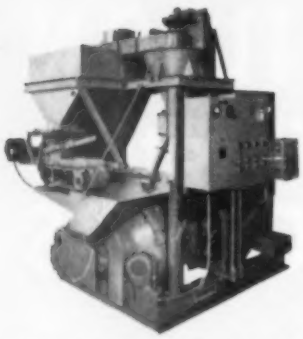
DENVER EQUIPMENT CO.

1400 Seventeenth St. • Denver 17, Colorado

DENVER • NEW YORK • CHICAGO • VANCOUVER • TORONTO

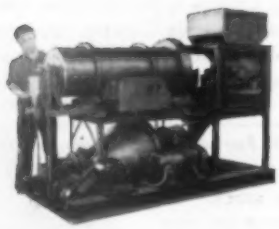
MEXICO, D. F. • LONDON • JOHANNESBURG

"Packaged Pulverizers"



DRY GRINDING UNIT

Make power connections only and the Hardinge dry grinding unit is ready to perform. Self-contained and portable, 7'8" high. Complete with Constant-Weight Feeder, Conical Mill, "Gyrotor" Air Classifier, dust collector, product collector and "Electric Ear" grinding control. Ideal for small commercial operations or pilot plant testing layout.



WET GRINDING UNIT

Power and water connections only are needed to put the Hardinge wet grinding unit into operation. Self-contained and portable, 6½' high. Includes Conical Mill, Counter-Current Classifier, launders, feeder, pump and "Electric Ear" grinding control.

Write for Bulletin AH-448-8 describing both wet and dry units.

HARDINGE
COMPANY, INCORPORATED
YORK, PENNSYLVANIA · 240 Arch St. · Main Office and Works
New York · Toronto · Chicago · Hibbing · Houston · Salt Lake City · San Francisco

pit and quarry

WALTER E. TRAUFFER
Editor

HARRY F. UTLEY
Pacific Coast Editor

ROY L. PECK
Field Editor

BUREN C. HEROD
Field Editor

M. E. ANSEL
Assistant Editor

JAMES G. KOSTKA
Director of Marketing and Research

JANET M. COHN
Editorial Assistant

JAMES E. MONTGOMERY
Chairman of the Board

WILLIAM A. WILSON
President

RAY L. SMITH, JR.
Senior Vice-President

W. T. KLUSSMAN
Secretary-Treasurer

ROBERT L. RUDD
Circulation Manager

GEORGE P. GRANT
General Sales Manager

HAROLD L. DAVIS
Production Manager

CHICAGO BUSINESS OFFICE
431 South Dearborn Street, Chicago 5, Illinois, HArrison 7-8558

FRANK J. CORNYN
Vice-President and Midwest Sales Manager

RAYMOND S. NEUWELT
Midwest Advertising Manager

NEW YORK BUSINESS OFFICE
370 Lexington Avenue, New York 17, N. Y., MUrray Hill 5-4438

JOHN R. DUBLE
Vice-President and Eastern Sales Manager

RICHARD J. MURPHY
Eastern Advertising Manager

CLEVELAND BUSINESS OFFICE
432 The Arcade, Cleveland 14, Ohio, CHerry 1-4431

CHARLES H. BUSSMANN
Vice-President and Central Sales Manager

J. G. JOHNSON
Central Advertising Manager

WEST COAST OFFICE
HARRY F. UTLEY, 820 N. Magnolia Avenue, Whittier, California

REPRESENTATIVES

FRED W. SMITH
1201 Forest View Lane, Vesthaven, Birmingham 9, Ala., TRemont 1-5762

THE McDONALD-THOMPSON CO.
San Francisco, California

EDWARD T. THOMPSON
3727 W. 6th Street
Los Angeles 5, California

T. HARRY ABNEY
National Building
Seattle 4, Washington

ROY M. McDONALD
625 Market Street
San Francisco, California

ROBERT H. HEIDERSBACH
222 Colorado National Bank Bldg.
Denver 2, Colorado

FRANK N. VICKREY
3217 Montrose Blvd.
Houston 6, Texas

TED R. TRAUTMANN
2010 South Utica
Tulsa 4, Oklahoma

No. 25 NORTHWEST for COLONIAL Sand & Stone Co. New York

IF YOU HAVE A NORTHWEST CRANE YOU HAVE A MONEY MAKER IN THE YARD

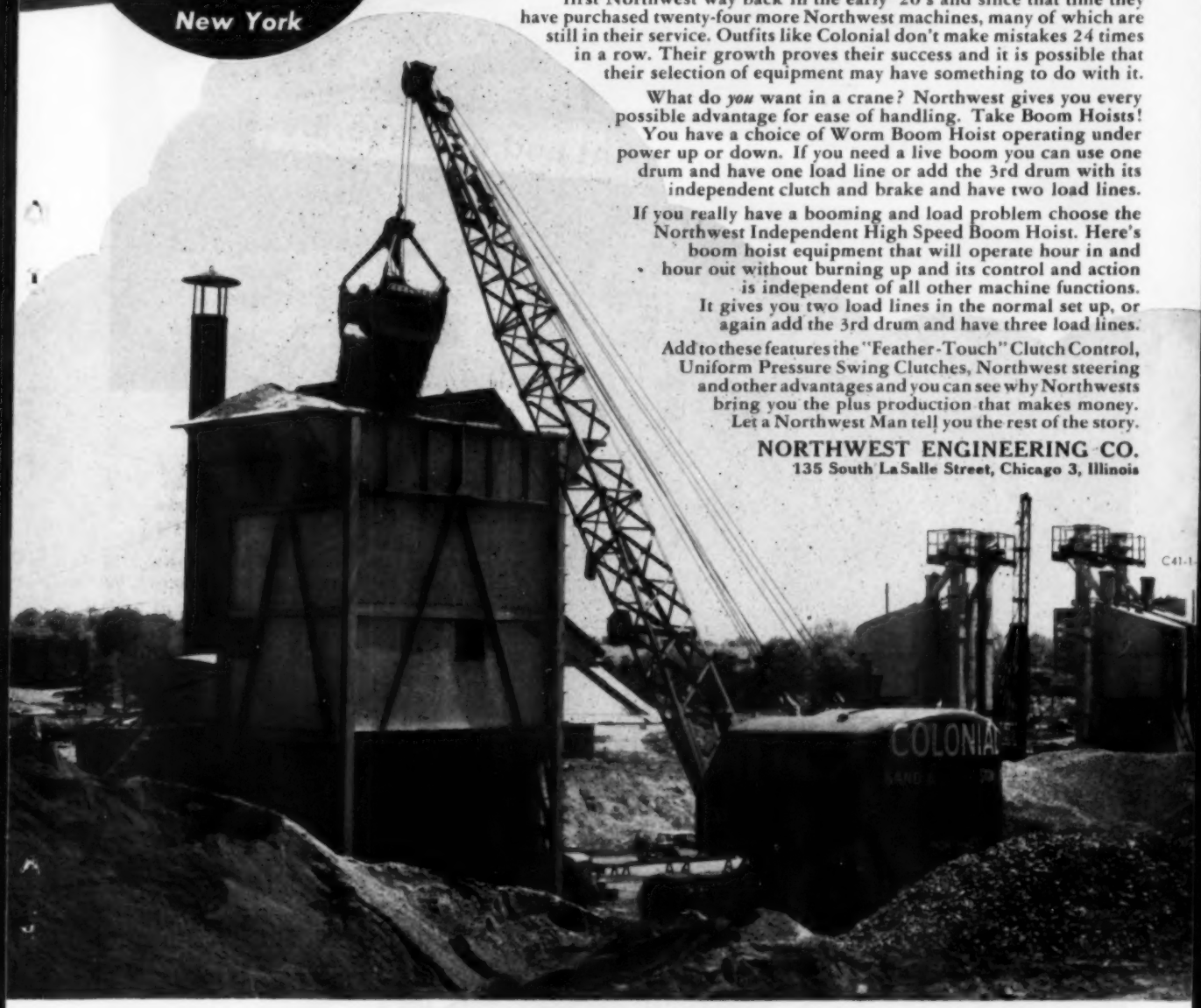
Colonial Sand and Stone Co. of New York has been in business a long time. They bought their first Northwest way back in the early '20's and since that time they have purchased twenty-four more Northwest machines, many of which are still in their service. Outfits like Colonial don't make mistakes 24 times in a row. Their growth proves their success and it is possible that their selection of equipment may have something to do with it.

What do *you* want in a crane? Northwest gives you every possible advantage for ease of handling. Take Boom Hoists! You have a choice of Worm Boom Hoist operating under power up or down. If you need a live boom you can use one drum and have one load line or add the 3rd drum with its independent clutch and brake and have two load lines.

If you really have a booming and load problem choose the Northwest Independent High Speed Boom Hoist. Here's boom hoist equipment that will operate hour in and hour out without burning up and its control and action is independent of all other machine functions. It gives you two load lines in the normal set up, or again add the 3rd drum and have three load lines.

Add to these features the "Feather-Touch" Clutch Control, Uniform Pressure Swing Clutches, Northwest steering and other advantages and you can see why Northwests bring you the plus production that makes money. Let a Northwest Man tell you the rest of the story.

NORTHWEST ENGINEERING CO.
135 South La Salle Street, Chicago 3, Illinois



NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 50-Ton Capacity	¾ Yd. to 3 Yd. Capacity	⅝ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

THE GREATEST COMBINATION OF PROVED ADVANTAGES EVER BUILT INTO A SHOVEL, CRANE, DRAGLINE OR PULLSHOVEL

NORTHWEST

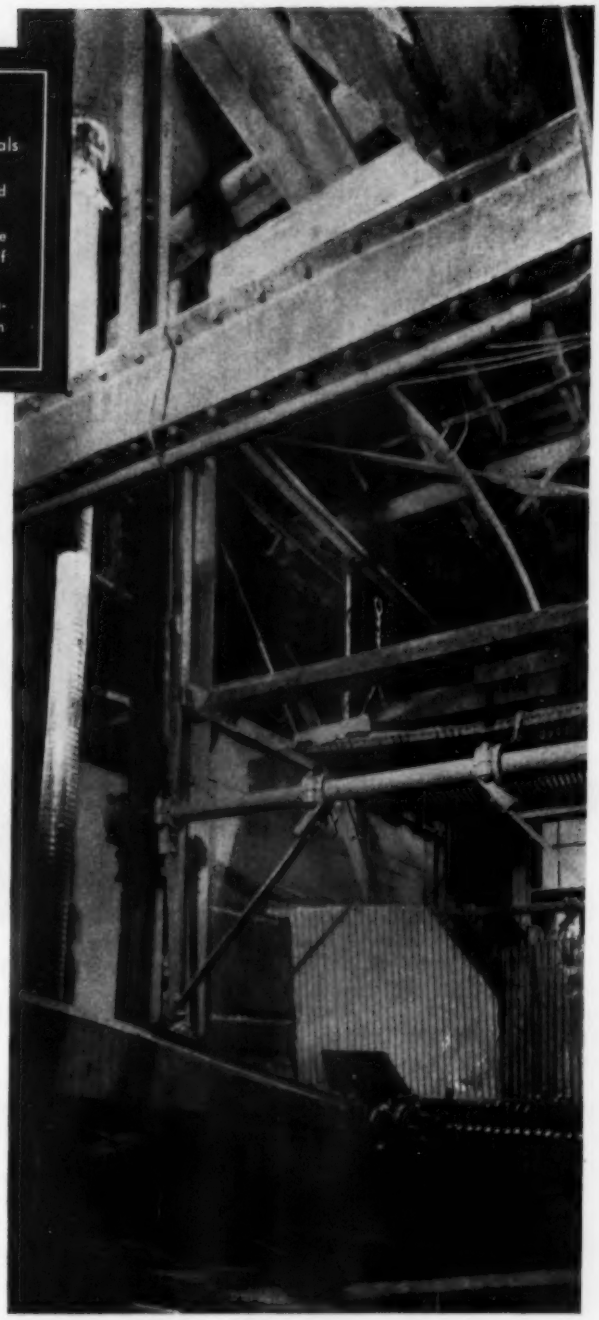
● Check the Jeffrey line when specifying parts or accessories for any of your materials handling jobs. Jeffrey products have been time-tested on original equipment and as replacements in all kinds of industrial applications. Their design, materials and workmanship are of the finest, assuring efficient, low-cost service.

Jeffrey transmission products are widely known for quality and dependability. Many of the most popular types of chain were originated and patented by Jeffrey and since have been adopted as standard throughout industry. Send for complete data. Distributors in principal cities. The Jeffrey Manufacturing Company, 917 North Fourth Street, Columbus 16, Ohio.

JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT...
TRANSMISSION MACHINERY...
CONTRACT MANUFACTURING

GOODYEAR INDUSTRIAL PRODUCTS
G.T.M.-Specified Diversipipe for handling abrasive materials
A Long-lived abrasion- and weather-resistant cover
B Reinforcement of steel wire helix plus wrapped plies of heavy-duty fabric
C Special rubber tube to withstand abrasion and corrosion



Twice a steel pipe's life—still has years to go

The silica-sand-and-water that's so effective at cutting solid marble also gouges through steel pipe in short order. In fact, the heaviest pipe this Great Lakes' firm used on its cutter barely made it to the 2½-year mark. And throughout its life, repairing leaks had been an all-too-frequent chore.

But a suggestion by the G.T.M.—Goodyear Technical Man—changed all that. For the bigger pump-to-storage-tank line, he specified Diversipipe—rugged rubber pipe with phenomenal abrasion-resistance. And it was Style M Sandblast Hose for the tank-to-saw-blade link—where more flexibility is needed. The pay-off: The G.T.M.'s recommendation *has already put in close to 5 years of trouble-free service—looks good for many more.*

What's more, time- and money-saving tips like this are everyday routine with the G.T.M.—wherever industrial rubber products are used. See for yourself—by contacting him through your Goodyear Distributor—or writing Goodyear, Industrial Products Division, Akron 16, Ohio.

DIVERSIPIPE by

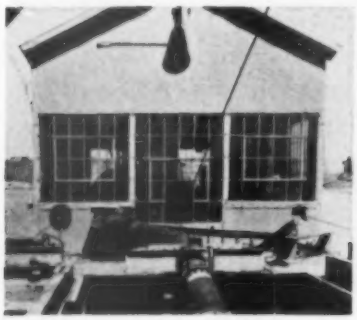
GOODYEAR

THE GREATEST NAME IN RUBBER

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

Amsco pump application file at: Consumers Company, South Beloit, Wisconsin

"We've used Amsco pumps since we started . . . very satisfactory, too . . ."



That's what Superintendent Theron Carter of Consumers Company says about his Amsco® pumps. And he adds:

"Not one shell has had to be thrown away since 1951. Bearings haven't been changed in either pump (both 16″). Stones as large as 8″ have been pumped without pump damage. And when service was necessary, I found the Amsco people ready and co-operative at a minute's notice."

Before Consumers started business, Amsco engineers were consulted for advice on pump sizes. They recommended a 16″ Amsco on 800′ of pipeline. Later, the pipe went to 1,700′ and an Amsco 16″ booster was put on. Now the pipe is 1,200′ between pumps and another 825′ to the wash plant.

Material is 80% sand, 20% gravel, dredged from 70′ depth with another 10′ lift from dredge to booster and 35′ lift from booster to wash plant.

Mr. Carter builds up water end parts with Amsco Welding Rod. He estimates two months' impeller service on the dredge, four months on the booster.

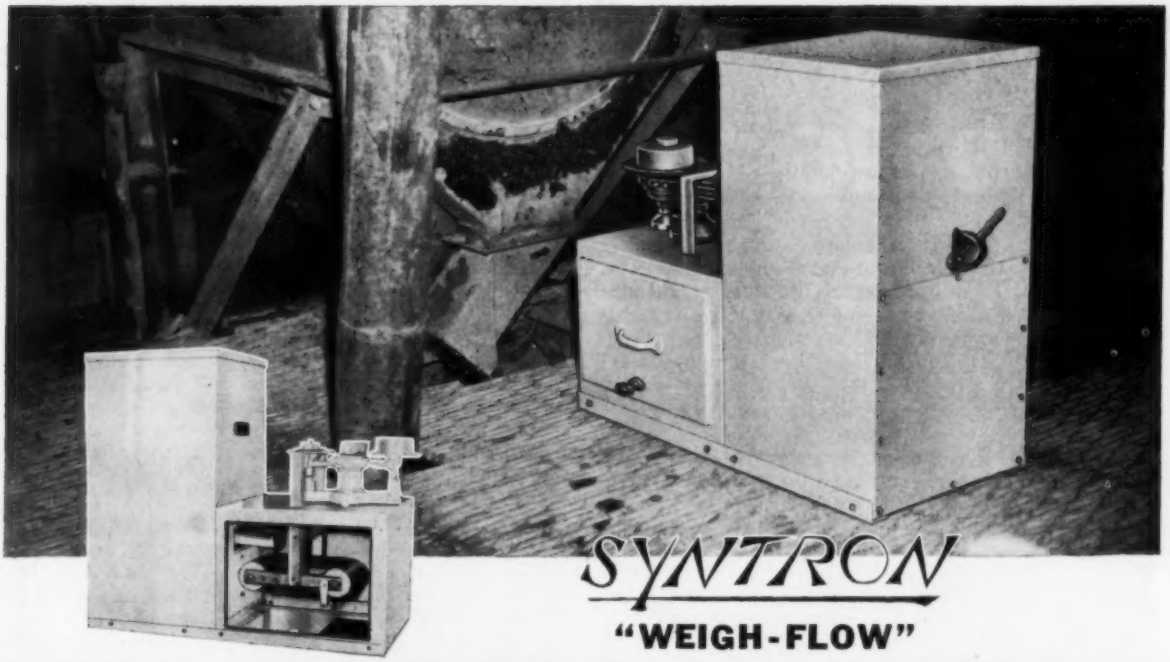
Quick Facts About Amsco Pumps

Whether your dredging operation is large or small, you can get an Amsco Dredge Pump to handle the job. Standard sizes range from 6″ to 20″ discharge openings. Larger sizes are also available. An Amsco pump engineer will be glad to discuss your requirements, or write for Bulletin 1052P, giving full information and specifications on the Amsco line.

AMERICAN Brake Shoe COMPANY

AMSCO American Manganese Steel Division
Chicago Heights, Illinois

ELECTRONIC CONTROL—
the most accurate, continuous weigh control yet developed



GRAVIMETRIC FEEDERS

Automatically weigh and feed bulk materials at controlled rates.

SYNTRON "Weigh-Flow" Gravimetric Feeders will increase the capacity and efficiency of mixers, dryers, and other processing equipment and improve the uniform quality of the end product.

The Syntron "Weigh-Flow" Gravimetric Feeders are the most accurate and most dependable weigh feeding equipment available. Fully automatic, the rate of feed is controlled electrically by the load on a scale—suspended, constant speed conveyor belt. The scale automatically corrects any variation in load on belt to an accuracy possible only with Electronic weigh control.

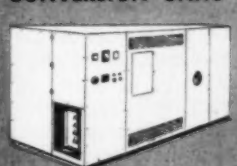
SYNTRON "Weigh-Flow" Gravimetric Feeders are built for long, continuous, trouble-free service. They are simple, and functional in design, keeping moving parts at a minimum. This means low cost maintenance. Syntron Gravimetric Feeders are available in a standard range of styles and sizes with capacities from pounds to 100 tons per hour.

SYNTRON'S years of experience in the materials handling field are available to you, send us details of your weigh feeding problem.

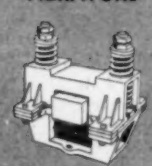
Builders of Quality Equipment for more than a Quarter-Century

Other SYNTRON Equipment of proven Dependable Quality

AC TO DC POWER CONVERSION UNITS

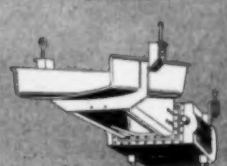


BIN VIBRATORS



GASOLINE HAMMER ROCK DRILLS

VIBRATORY FEEDERS



Write for Catalog data — FREE

SYNTRON COMPANY
385 Carson Avenue — Homer City, Penna.

The Editor's Page

Attend Your Industry's Convention!

CONVENTION time is rapidly approaching for many of the major associations of the Pit and Quarry industries. Beginning in mid-January, in a period of six weeks, there will be no less than 18 national conventions of these industries, and meetings of related groups and of technical and engineering societies. At least one of these is of interest to every nonmetallic minerals producer. Advance information indicates that these will be individually the most interesting conventions ever held, not only because of the wide range of important subjects on their programs, but also because they are coming at a time when we are at an economic crossroads. There are always many sound reasons why a producer should attend at least his own industry convention. This year the uncertainty about business conditions in the coming year makes it imperative that he avail himself of the best obtainable information and advice, at first hand.

THE important conventions ahead, in the order in which they will be held, are as follows: The National Agricultural Limestone Institute, annual convention, Hotel Statler, Washington, D. C., January 20 to 23, 1958; the National Crushed Limestone Institute, annual convention, Hotel Statler, Washington, D. C., January 24, 1958; the National Sand and Gravel Association, annual convention, in conjunction with the annual convention of the National Ready Mixed Concrete Association, Conrad Hilton Hotel, Chicago, Ill., with combined machinery exhibits there and at the Coliseum, February 10 to 13, 1958; the National Slag Association, annual operators' meeting, Sheraton-Blackstone Hotel, Chicago, Ill., February 11-12, 1958; the National Crushed Stone Association, annual convention and concurrent machinery exhibition, Conrad Hilton Hotel, February 17 to 19, 1958.

During this period there will also be a number of important conventions of industries closely related to the nonmetallic minerals industries, and of various technical societies of interest to them. These include, in the order scheduled: The American Road Builders Assn.; National Bituminous Concrete Assn.; Associated General Contractors; National Ready Mixed Concrete Assn.; American Institute of Mining, Metallurgical and Petroleum Engineers (including the Society of Mining Engineers); National Concrete Masonry Assn.; National Concrete Contractors Assn.; American Concrete Institute; American Concrete Pipe Assn. Dates and places for these meetings can be found in the Coming Events column in this issue.

THE N.A.L.I. and N.C.L.I. conventions in Washington promise to be the best yet held by these associations. They will certainly be the most important because of uncertainty as to the future of the Agricultural Conservation Program and the progress of the road program. Many other important subjects will also be discussed. The N.A.L.I. sessions will begin on Wednesday morning, January 22, and will continue through Thursday afternoon. The N.C.L.I. meetings are scheduled for all day Friday, January 24.

The N.S.G.A.-N.R.M.C.A. combined conventions in Chicago will offer many features, topped by the combined biennial show of machinery and supplies for both industries. As in 1956, the show will be divided between the Conrad Hilton Hotel, where the convention meetings will be held, and the Chicago Coliseum. The show will be the largest ever staged by these associations and will present a wide variety of equipment.

THE convention sessions will be so arranged that there will be ample time to visit the exhibits. Nevertheless, the program also will be outstanding, including such subjects as zoning, public relations, railroad ballast, traffic problems, taxes, depreciation, cost accounting, fiscal problems, operating problems, sales agreements, industrial radio, merchandising practices, group insurance, pensions, profit-sharing plans, group bargaining, research, etc.

Monday and Tuesday, February 10 and 11 will be devoted entirely to inspection of the exhibits, as will also Wednesday and Friday afternoons. The general sessions of the two conventions will open simultaneously on Wednesday, February 12. There will also be simultaneous sessions of the two groups on Thursday morning and afternoon and on Friday morning, and a joint session on Friday morning.

Information on the program of the National Slag Association meeting is not yet available, but it has been scheduled so that members can take in the N.S.G.A.-N.R.M.C.A. machinery exhibition.

THE N.C.S.A. convention will feature a wide range of important subjects and the biennial manufacturers' division in the Conrad Hilton Hotel. This show is expected to set a new record in size and in the variety of equipment exhibited. The exposition will be open all day on Monday, February 17, all day on Tuesday except from 12:00 noon to 2:30 p.m. and until 12:00 noon on Wednesday. On Monday afternoon and Wednesday morning there will be no convention sessions, permitting everyone ample time at the show.

The subjects to be discussed at this convention include public relations, taxation, percentage depletion, public and employee relations, legislation, technical and operating problems, etc.

The complete official program of the N.A.L.I. convention is published in this issue of PIT AND QUARRY. Those of the N.S.G.A.-N.R.M.C.A. and the N.C.S.A. conventions will be published in the January Annual Review and Forecast Number. Along with these programs, we will publish layouts of the machinery exhibits keyed to a complete list of the exhibitors, as well as complete information on equipment to be exhibited at each booth, and names of men to be in attendance.

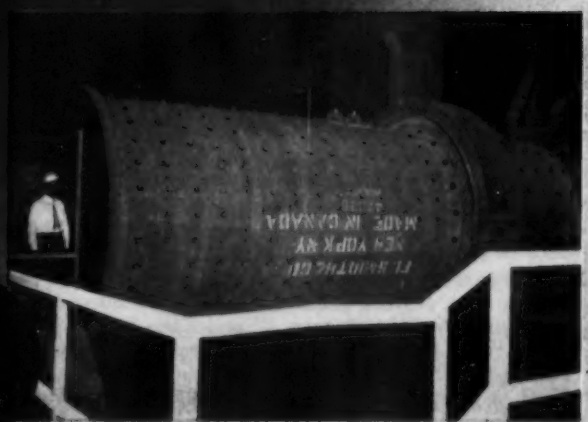
Advance registrations and other indications point to a record-breaking attendance at all these conventions. If you have not already made your hotel reservation, we urge you to do so at once.

Walter E. Trauffer

Smidth

symetro drives

FOR SMIDTH GRINDING MILLS



F. L. SMIDTH & CO.

Engineers and Machinery Manufacturers

11 West 42nd Street • New York, N.Y.

Copenhagen London Paris Bombay

Washington News Letter

By S. HERBERT UNTERBERGER

IN Washington, as everywhere else, three subjects form the substance of almost every discussion. They are satellites, election returns, and the business outlook, or, in more general terms, science, politics, and economics.

Among these subjects, official Washington clearly feels most at home in the area of politics, with which it has been dealing for nearly two hundred years. However, in the last two decades, extreme necessity has demanded a greater interest in and familiarity with economics.

The field of science, however, is a relatively new area, with which officialdom in general has had very little connection. The events of the last month have convinced many a politician that, only at his own peril, can he continue to ignore the scientific problem which may decide the fate of the nation.

As might be expected in exploring unfamiliar areas, there has been a great deal of fumbling; and, despite the President's positive action of appointing a special assistant for science and technology, a great deal of additional fumbling can be expected. To date, the authority of Dr. Killian, who was appointed to that post, has not been too carefully defined. The general statement was made that he will be invested with all of the authority which the President has. Without further demarcation, this is not saying very much, because the President's authority itself has never been very carefully defined. It is a flexible matter, depending frequently on the personality of the President, as well as on the times and conditions under which he utilizes his authority.

While comparisons have been made between the current missile program and the atomic bomb project of World War II, the situations are not really parallel. The war-time project had a very simple goal, namely, to develop a bomb, utilizing nuclear fission, which would provide the maximum destructive power. The economy was under rigid governmental control; and, therefore, when this project was given topmost priority, this assured its access to all of the materials it needed, as well as to all the manpower. In addition, there was the war-time momentum to carry it forward. Nevertheless, from subsequent discussions and writings, it is clear that in the atomic bomb project some fairly complex internal differences had to be resolved in the process of achieving its results.

The current situation, with respect to missiles, is quite different. There is no priority system, either on materials or on manpower. No doubt, Dr. Killian's personal prestige in the field of science will prove most helpful in recruiting the necessary personnel, but he is, at the moment, armed with nothing more than that prestige. Furthermore, in contrast to the atomic bomb project, the problem now is not one of starting an organization from scratch for the purpose of achieving a particular goal, but rather of combining and co-ordinating the work of a large number of organizations, some military, some civilian, and some mixed, into a functioning whole, designed to achieve a particular objective in the minimum of time.

Finally, the objective is somewhat unclear. It could well turn out that Dr. Killian's first job will be to try to define what he is trying to achieve. Understandably, the President's statements on these matters are ambiguous; if he were to define them, he might be delivering the most valuable of military secrets to all potential enemies. Once the general objective is established, it will then be necessary to turn to the more difficult task of convincing all kinds of persons with all kinds of diverse interests to co-operate in its attainment.

In Washington, there is much doubt that this can be accomplished under the present organizational arrangement. Rarely has any program been moved forward efficiently and rapidly, unless it is placed in the hands of a single agency with a single directing head invested with sufficient authority to command the required resources, both material and human. It is being freely predicted that, considering the dynamics of bureaucracy, once the first step has been taken, the succeeding steps are preordained. When co-ordination yields unsatisfactory results, the next step will be the establishment of a "czar"; and when this plan proves inadequate, the next step will be the establishment of a Missile Commission.

To many persons in Washington, the only question is whether such a Commission should be formed immediately or whether the program should run its course. The argument for moving rapidly towards a strong formal organization for advancing the missile program is primarily a political one. The practical politicians recognize that much progress must be shown in a short period of time, or the future of Republican leadership in Washington is dim indeed. And this point leads directly to the discussion of election returns.

Here the story is well known. Particularly in the state of New Jersey and in the city of New York, despite the most furious efforts of the Republicans, the Democrats swept the field. In Philadelphia, as well, although no position more important than district attorney was involved in the recent election, the Democrats managed to unseat the few remaining Republican officeholders.

The defeat in New Jersey was by far the most telling, since it was here that the national administration took the most direct interest and lent its prestige most directly to the Republican candidate for governor. This is, of course, the campaign in which the vice-president personally participated. The defeat of Republican candidates by a very substantial margin will, no doubt, become an important factor in the consideration of whether Vice-President Nixon will be the next Republican candidate for President. Regardless of where the Republicans look, they can find almost no basis for consolation in the election returns.

The most popular explanation of the returns is the unfortunate timing of the election, immediately on the heels of the Russian satellite achievement. This is probably a superficial explanation. It might be sufficient to explain small victories but it could hardly explain the huge plurality of

(*Continued on page* 48)

Convert Unsuitable Materials into

Specification Sand

BY processing rock, coarse aggregate, and unusable natural sand, the Allis-Chalmers rod mill gives you specification sand *where and when you want it*. It extends the life of natural deposits. It eliminates the expense and inconvenience of distant shipments.

Specification Flexibility

Meeting varying specifications with an Allis-Chalmers rod mill is merely a matter of changing feed, feed-water rate, or rod charge. Once mill is adjusted to produce a required product, it needs very little attention.

Cubical Product

Rod mill action breaks long, flat particles . . . knocks corners off rough pieces, yet does not produce an excessively smooth particle. Size distribution is excellent. Product is ideal for use in concrete.

"Manufacturing" sand is a particularly tough, abrasive operation. That's why you'll want the Allis-Chalmers rod mill. It's a rugged machine that has proven most economical for grinding sand — in terms of long life and low operating costs.

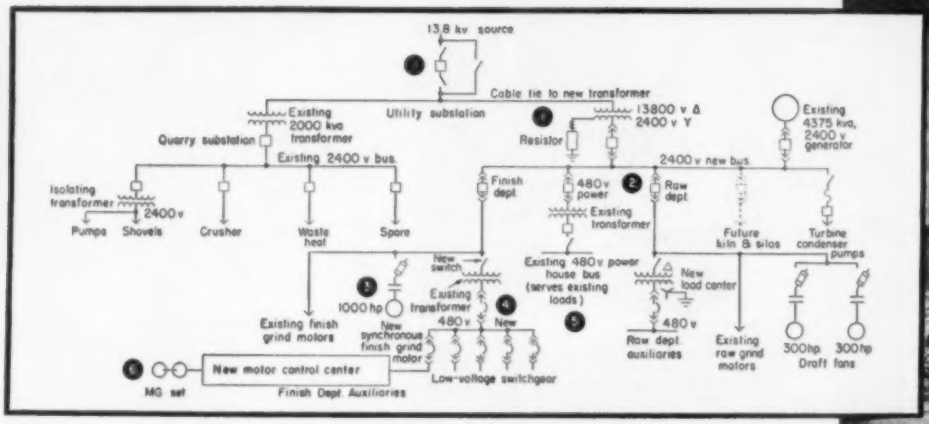
For complete information, see your A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis. Ask for Bulletin 07B6718A.

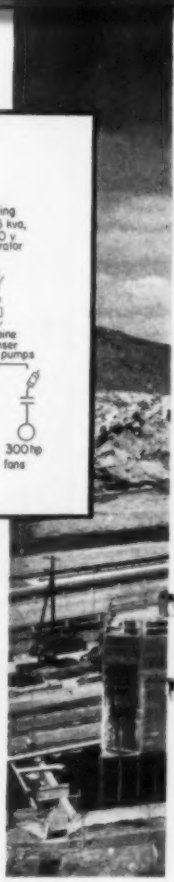
ALLIS-CHALMERS

A-5311

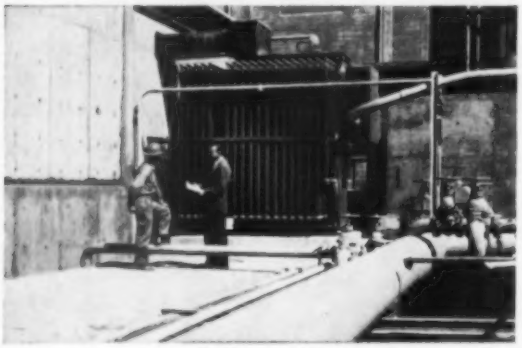
ENGINEERING REPORTS:

MODERNIZATION of plant electrical system is shown in one-line diagram, keyed to photos.

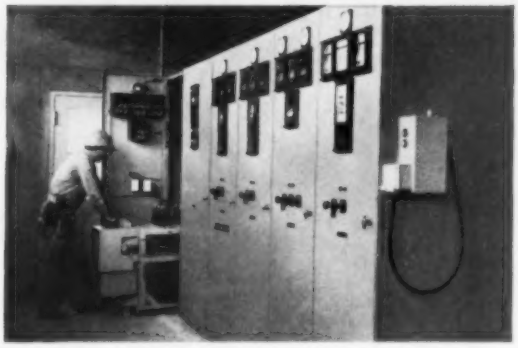




1 MINIMUM SHORT CIRCUIT DUTY on 2400-volt bus is provided by high impedance characteristic of new 5000-kva transformer. Neutral resistance grounding extends life expectancy of plant's 2400-volt equipment.



2 DUST PROBLEMS MINIMIZED by construction of pressurized switchgear room, housing new G-E metal-clad switchgear, which is throat connected through wall to adjacent outdoor G-E 5000-kva transformer.

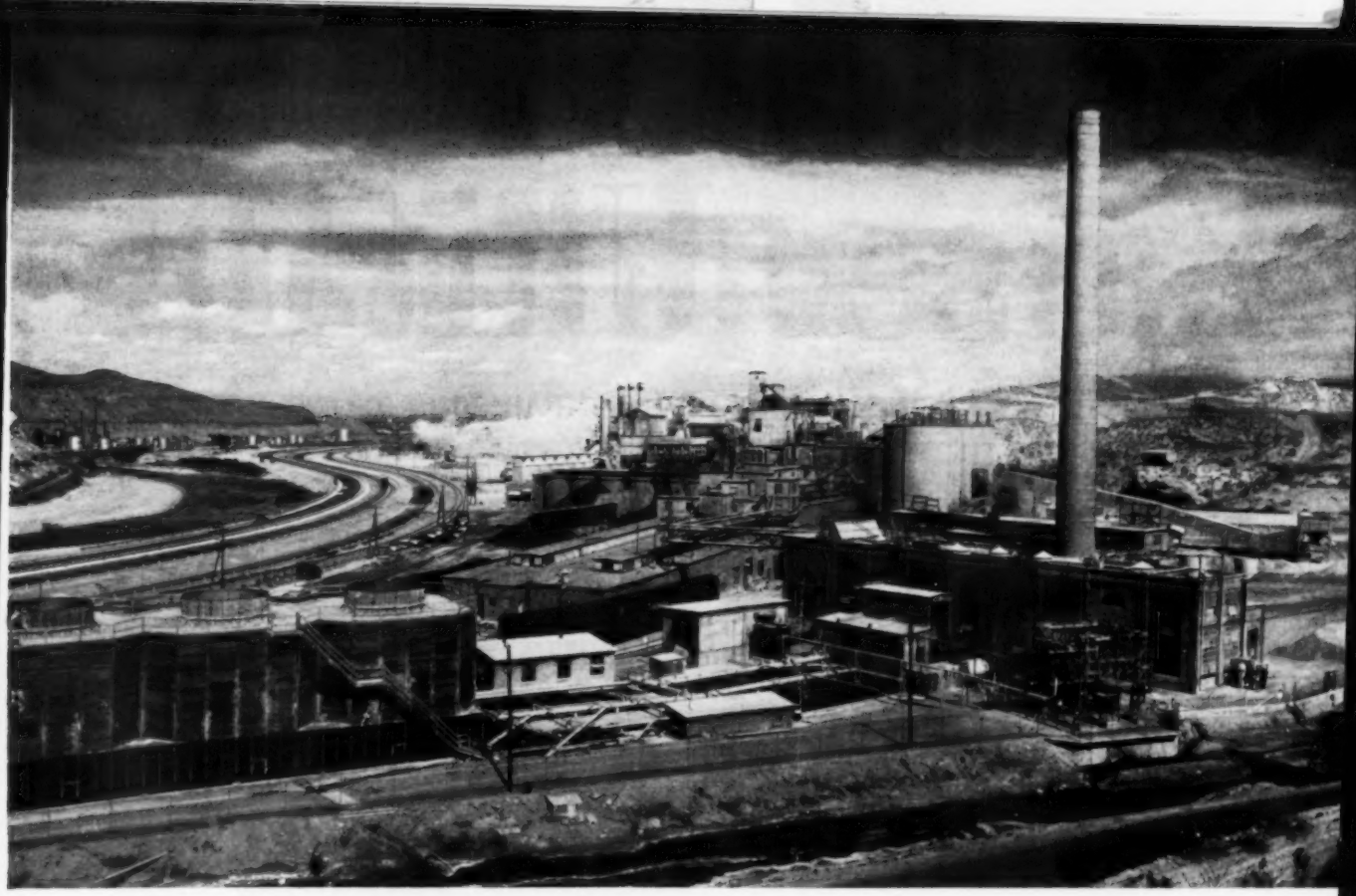


3 HEAVY LOAD STARTING for new grinding mills, powered by G-E 1000-hp, 2300-v, 180-rpm synchronous motors, is furnished by relating torque-speed characteristics of mill to those of motor and power supply system.

4 MODERNIZATION of finish dept's. 480-v supply was achieved by relocating existing 2400–480-volt transformers outdoors. Drawout switchgear with air circuit breakers provides safer, convenient power distribution.

5 DUST CONTROL, always critical in cement plants, is emphasized by arid climate. This rugged 150-hp, 2300-volt Tri-Clad* a-c motor drives fan for one of plant's numerous dust collectors. *Registered trade mark of General Electric Co.

6 DEPENDABLE EXCITATION for 1000-hp synchronous ball mill motor is furnished by General Electric motor-generator set, comprised of direct-current generator driven by 30-hp Tri-Clad alternating current motor.



At a large Southwest cement plant . . .

General Electric engineers, equipment help expand facilities, modernize power system

DISCUSSING new system—laid out jointly by G-E application engineers and cement company engineers—are plant engineer, electrical foreman and General Electric sales engineer, G. R. Yelderman (r).

As part of a multi-million-dollar company expansion program, one of the large cement plants in the Southwest* recently completed modernization of production facilities and the electrical distribution system.

General Electric system engineers, working on the scene with plant engineers, helped design and install the remodeled electrical system, synchronizing two separate power sources into a flexible power distribution system.

PRIOR TO EXPANSION, the plant generated a portion of its own power needs and purchased the remainder from the utility. Changes in the kiln department reduced the amount of steam available for the plant's power generation system and necessitated an increase in the purchased power. To handle this increased incoming power, a General Electric substation was installed, consisting of a 15-kv power circuit breaker, and a 5000-kva medium transformer to step down voltage from 13.8-kv to 2.4-kv. In addition, open-type switchgear was replaced by General Electric enclosed metal-clad switchgear.

WHEN YOU MODERNIZE or expand your cement plant facilities, General Electric engineers and equipment can work for you. Contact your nearest G-E Apparatus Sales Office early in your planning or write to General Electric Company, Section 658–20, Schenectady 5, New York.

*Name furnished on request.

Engineered Electrical Systems for the Rock Products Industry

GENERAL ELECTRIC

HERE'S WHY YOU CAN RELINE IN HALF THE TIME WITH

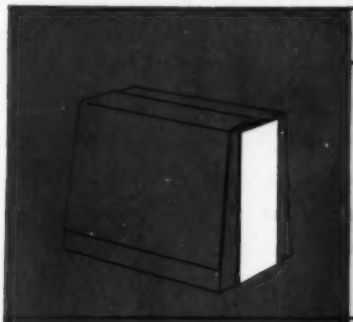
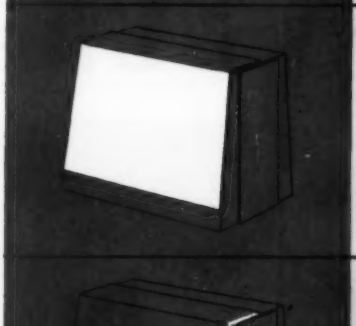
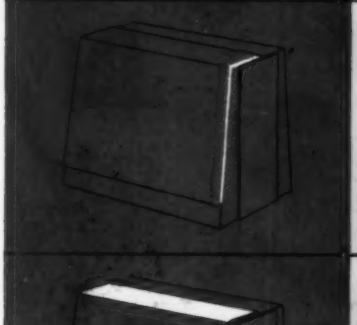
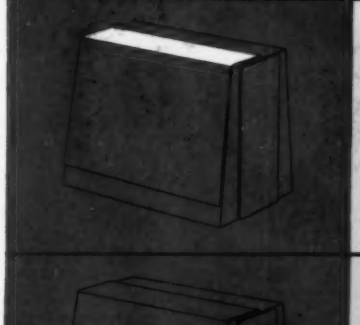
Kaiser Unitab*

EACH OF THESE FIVE COMPARISONS SHOWS ANOTHER

COMPARISON:	CONVENTIONAL BRICK	KAISER UNITAB LINERS
1 CARDBOARD SPACERS FOR LONGITUDINAL EXPANSION	INSTALL BY HAND	ATTACHED TO BRICK AT FACTORY
2 STEEL PLATES BETWEEN BRICKS FOR BONDING	INSTALL BY HAND	ATTACHED TO BRICK AT FACTORY
3 PROVISIONS FOR CIRCUMFERENTIAL EXPANSION	INSTALL CARDBOARD SPACERS BY HAND	EXPANSION PROVIDED BY THICKNESS OF ADHESIVE THAT BONDS SHIM TO BRICK
4 HOT FACE INDICATOR	NO HOT FACE INDICATOR	HOT FACE CLEARLY IDENTIFIED BY TOUCH OR SIGHT
5 EFFECT ON REDUCING SHELL TEMPERATURE	NONE	DESIGN PROVIDES HEAT BUFFER TO REDUCE SHELL TEMPERATURE

Kiln Liners

UNITAB LINER INSTALLATION ADVANTAGE!

	UNITAB LINER FEATURE
	Combustible spacer automatically provides correct allowance for longitudinal expansion (between rings).
	Bonding shim to liner assures automatic placement of shim.
	Thickness of combustible adhesive provides correct allowance for circumferential expansion (within ring).
	Plate overlapping hot face makes visual inspection quick—easy to see that each brick is correctly installed.
	Half-inch gap between end of shim and shell acts as heat buffer to reduce shell temperature for greater kiln efficiency.

Savings up to 50% on installation time have already been reported by operators using Kaiser Unitab Liners, the industry's first kiln liners with bonded shims and spacers.

Because the shim overlaps the hot face of the liner, the hot face is easily identified by sight or touch . . . makes installing Unitab Liners almost as simple and as fast as lining up books on a shelf!

In addition, as this overlapping shim melts and oxidizes, feed particles combine with it to give you a tight coating —fast.

Unitab Liners are made with Kaiser Periclase Chrome burned brick. Since 1945 this brick has pioneered every major improvement known today in basic liners for rotary cement kilns. Now with shims and spacers added it becomes the most advanced basic hot zone liner in the industry, coupling outstanding performance with easy, foolproof installation.

Why not let us show you how this original Kaiser Chemicals development can help you reduce kiln down time and give you improved hot zone service?

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Refractory Brick and Ramming Materials
Castables and Mortars • Magnesite • Periclase
Deadburned Dolomite

Call or write Kaiser Chemicals Division, Dept. C72X61, Kaiser Aluminum & Chemical Sales, Inc., at any of the Regional Offices listed below.

PITTSBURGH 22, PA. . . . . 3 Gateway Center
HAMMOND, IND. . . . . 518 Calumet Building
OAKLAND 12, CALIF. . . . . 1924 Broadway

* The product name "Unitab" is a trademark of Kaiser Aluminum & Chemical Corporation, and succeeds the former name "Unitized Kiln Liner T3." Patents for Unitab Liners have been applied for in the U. S. A. and foreign countries.

First on the job

THE AUTOCAR

When the going is tough and slippery, Autocar 6-Wheelers make it every time. You can't beat them for bulling heavy loads through mud, sand, wet clay, deep snow and ice. And on soft roads they give you turnpike traction. The axles of 6-wheelers provide extra driving wheels—a double contact with the road that brings you safely through. There are several tandem axles to choose from with ratings from 34,000 to 70,000 pounds, and Autocar engineers will help you choose the one that precisely meets your conditions of road and load. Then, in accordance with Autocar's custom-building practice, they design the rest of the unit to match—an integrated set of balanced heavy-duty components. The Autocar 6-Wheeler, like every other Autocar, has long life and stamina built into it. For the full story on the job these 6-wheelers can do for you, see your White-Autocar distributor.

White Autocar

AUTOCAR TRUCKS

AUTOCAR DIVISION

The White Motor Company • Exton, Pa.

after the storm

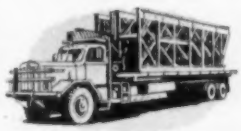
6-WHEELER

THE AUTOCAR 6-WHEEL CEMENT MIXER, capacities from 5½ to 14 cubic yards. Designed as an integrated, balanced unit, and specifically for the job.

THE AUTOCAR 6-WHEEL HIGHWAY TRACTOR pulls heavy payloads on long hauls. A real profitmaker in those states where multiple axles permit additional payload.

THE AUTOCAR 6-WHEEL LUMBER TRUCK drives right into the felling area and picks up a profitable load, with the sturdy construction and braking power to control it.

THE AUTOCAR 6-WHEEL OIL FIELD UNIT, ideal for hauling heavy loads. A sure winner over a rough track and geared to keep up with traffic on the highway.



Serving Industry in a **BIG** way

Raymond
SUPER ROLLER MILLS

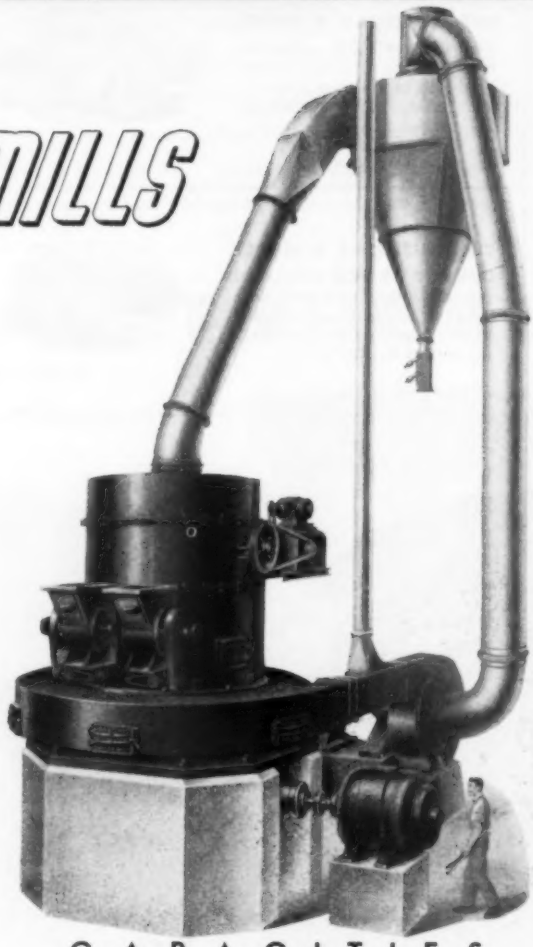
Modern mass production owes its economy to the use of large size, high capacity equipment instead of small multiple units of equivalent output.

In the pulverizing field, Raymond Super Roller Mills satisfy the maximum demands of industry for huge tonnages of high fineness materials. They do an outstanding job in plants handling 15, 20 to 30 tons or more per hour of gypsum, limestone, dolomite, phosphate rock, barytes, bauxite, clays and other non-metallic minerals.

The net savings from these big machines cut deeply into production costs due to centralized operation, simplicity of supervision and control, minimum maintenance, and easier handling of materials.

Available in several sizes, with or without Flash Drying for moisture removal while pulverizing.

Write for Catalog No. 79 and mention your product and capacity requirements



CAPACITIES

UP TO 30 TONS OR MORE PER HOUR

Also full range of sizes of intermediate and smaller type mills down to laboratory units for handling test batches.

COMBUSTION ENGINEERING, INC.

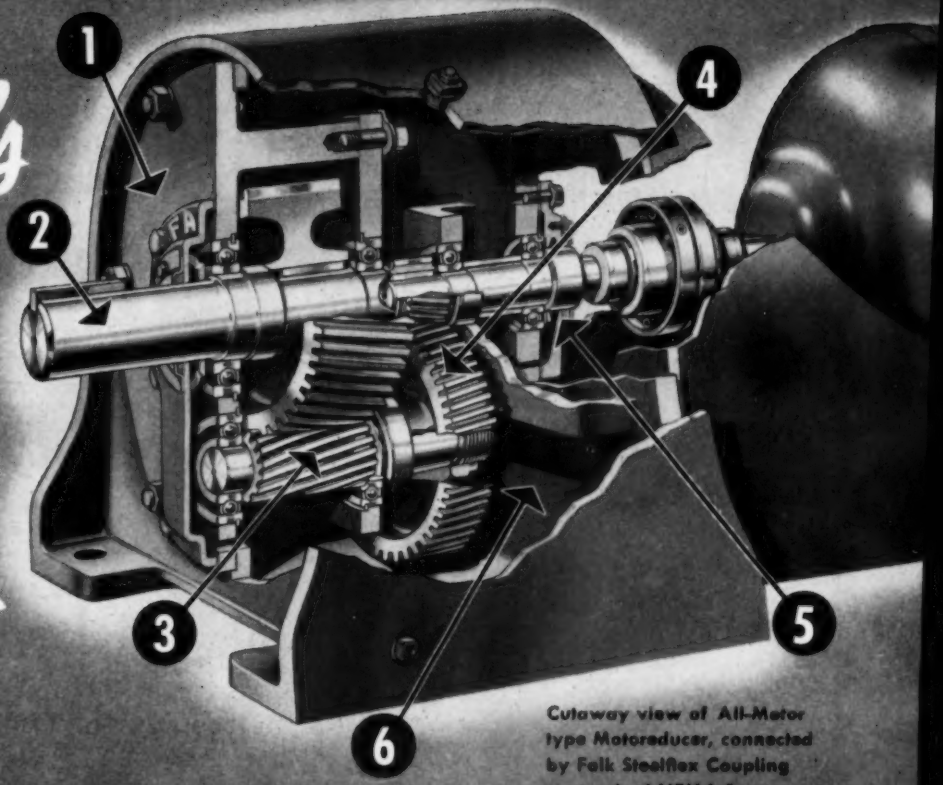
Raymond Division

1321 North Branch St.
CHICAGO 22, ILLINOIS

SALES OFFICES IN PRINCIPAL CITIES

Combustion Engineering-Superheater Ltd., Montreal, Canada

Here's the inside story—



Cutaway view of All-Motor type Motoreducer, connected by Falk Steelflex Coupling to standard NEMA frame motor

WHY Falk Motoreducers give better service—have longer life

Here is the "inside story" behind the all-steel All-Motor type FALK Motoreducer's universal reputation as a gear drive unmatched in quality, efficiency, dependability, ease of maintenance and long life. These "In-built" factors are—

1 **ALL-STEEL HOUSINGS.** Rugged, strong, rigid...all parts are manufactured from heavy steel plate, formed and welded in the Falk Weld Shop.

2 **LARGE OVERHUNG LOAD CAPACITY.** Large shafts, oversize bearings...rigid mountings with wide bearing spans to handle maximum applied loads.

3 **PRECISION GEARING.** Heat-treated alloy steel gearing, precision cut and shaved after heat treatment to eliminate distortion. Quiet, crown-shaved pinions.

4 **EXTRA-CAPACITY GEARING.** Special extra-capacity gear-tooth form with larger contact area gives greater strength, higher load-carrying capacity.

5 **SEALED HOUSINGS.** Splashproof, dustproof, oil-tight construction. Dual closures and one-way vents keep oil in, dust and moisture out.

6 **POSITIVE LUBRICATION.** Large sump capacity...oiltight construction assures clean lubricant...revolving elements lubricated by direct dip.

When you buy or specify the All-Motor type FALK Motoreducer, you get all these—plus the tremendous advantage of full interchangeability of motors. Switch motors as desired—use any make, style or type of standard foot-mounted motor within the unit's AGMA rating—with a minimum of difficulty or "down time."

Available in sizes up to 75 hp—*with or without motor*—from convenient factory, field or distributor stocks, from coast to coast. **Write for Bulletin 3100.**

60,000 HOURS WITHOUT A FAILURE!

Sixty thousand hours is a lot of hours—but the FALK Motoreducer in the unretouched photo above has served that long without failure or need of repair.

This 3 hp unit is one of over 60 FALK Motoreducers in daily service in an Eastern plant of a large milling company, whose president says, in part:

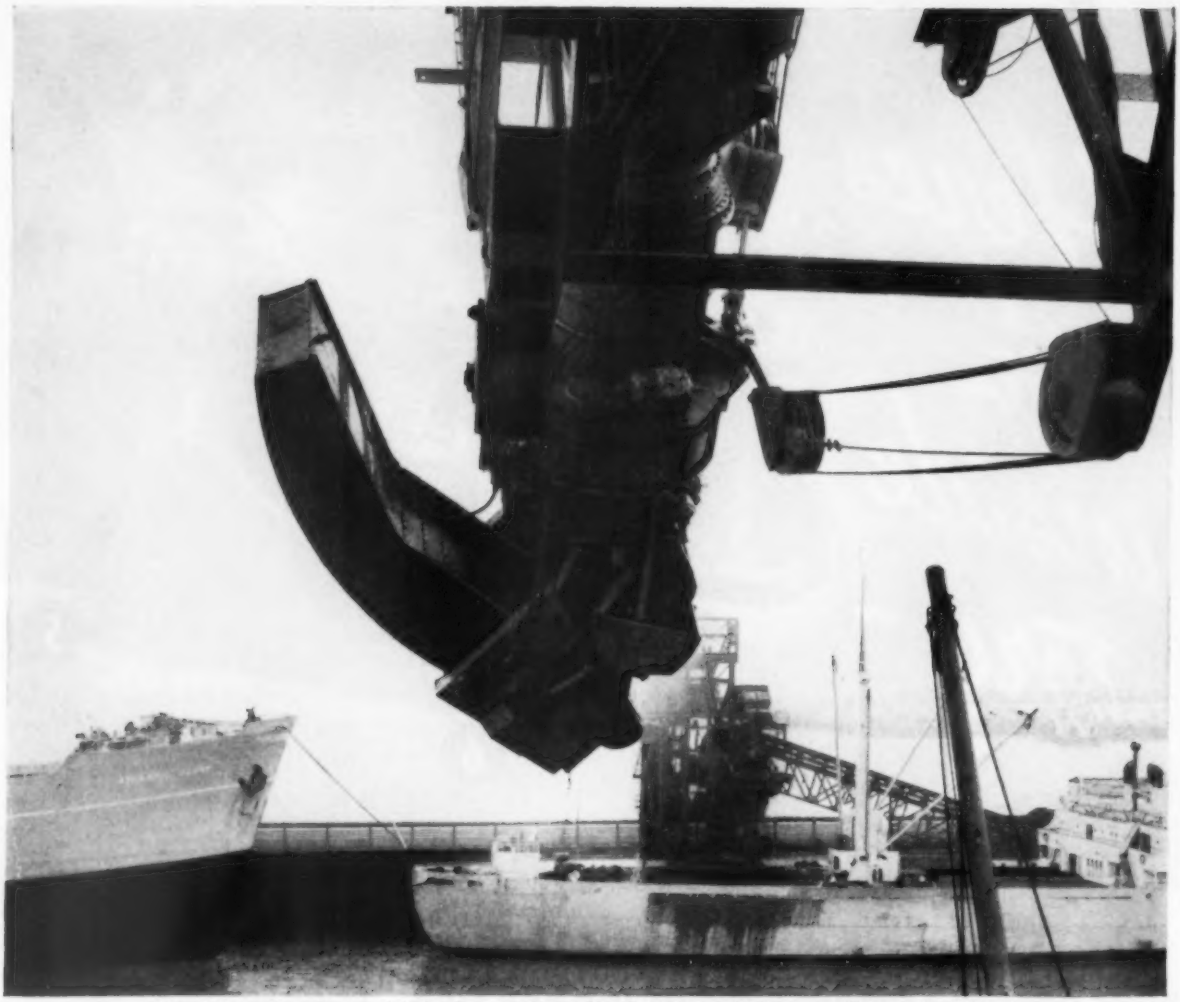
"One of the main advantages of FALK Motoreducers is their adaptability to any motor. Reducers and motors can be easily interchanged....Our service records confirm the wisdom of our choice of FALK equipment as our standard."

FALK ...a good name in industry

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

MANUFACTURERS OF

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining



At world's most modern coal docks, Newport News, Va., C&O uses coal trimmers of Lukens "T-1" Steel.

New Coal Loading Machine is tougher and lighter—made with Lukens "T-1" Steel

TRADEMARK

Tough, weight-saving Lukens "T-1" gives this trimmer added mobility.

When the C&O Railway designed this huge new coal trimmer, they chose Lukens "T-1" steel for its combination of high strength and toughness—plus ready workability. Construction required less steel, produced outstanding abrasion resistance.

Now with stepped up efficiency, this mammoth machine easily and economically deposits 2,000 tons of coal an hour deep in the holds of ships—with a minimum of wear and maintenance.

Whether you handle coal, stone, gravel or metal ores, Lukens "T-1" steel used in areas hardest hit by punishing abrasive impact will save you money, too. It has tripled the life of rock driers. The 321 minimum Brinell quality has been known to outlast previous metals by 18 to 1 in quarry wear plates. Chutes, hoppers, and mine cars are other typical applications.

And Lukens "T-1" steel retains its remarkable toughness at temperatures well below zero. Send for our informative illustrated booklet, "Lukens 'T-1' Steel." Write Manager, Marketing Service, Room 965, Lukens Steel Company, Coatesville, Pennsylvania.

LUKENS

Helping industry choose steels that fit the job

News of the Industry

Personnel Shift Follows Ideal Cement Company's Northwestern Acquisition

Spokesmen for the Ideal Cement Company, Denver, Colo., shortly after the firm's acquisition of the Northwestern Portland Cement Company, announced that the operation will be known as the Northwestern Division, Pacific Region, of Ideal.

Several personnel changes resulted from the acquisition. W. J. Conway, Ideal's Pacific Regional sales manager, will direct sales; E. F. Bollinger, Pacific Regional production manager, will supervise plant and quarry operations.

Gordon Tongue, formerly president of Northwestern, will become vice-president of Ideal, Northwestern Division, with headquarters in Seattle.

A. G. Stubblefield, formerly Montana Division sales manager for Ideal, has been named sales manager with offices in Seattle. George A. Lunday, assistant sales manager of the Montana Division, will assume Mr. Stubblefield's duties.

Continuing in positions formerly held with Northwestern at its plant in Grotto, Wash., are the following: Frank Baldwin, superintendent; James Halloran, quarry superintendent; and F. L. Richards, chief chemist and plant engineer.

Halliburton Oil Well Firm Names L. Campbell Chairman

Logan D. Campbell was elected chairman of Halliburton Oil Well Cement Company, to succeed the late Erle P. Halliburton, who died on October 13, 1957. Mr. Campbell was formerly vice-chairman of the Oil Well Servicing Company, Duncan, Okla.

William D. Owsley, senior vice-president, was elected a trustee of Halliburton employees' benefit fund, to replace the late Mr. Halliburton.

Halliburton has negotiated the purchase of Welex Jet Services through an exchange of stock. A new company, Welex, Inc., has been organized to operate as a wholly-owned subsidiary of Halliburton. Welex holders have approved the sale.

Roy O. Shaffer, president of Welex Jet Services, Inc., and Welex, Inc., Fort Worth, Tex., was elected a director.

William L. Cooper Joins Natl. Bituminous Concrete Assn.

The National Bituminous Concrete Association has named William L. Cooper, former executive secretary of the Washington (D. C.) Association of Plumbing Contractors, to its staff in Washington, D. C.

Mr. Cooper will handle the association's public relations activities, in addition to general duties as administrative assistant to H. K. Griffith, executive director of the group.

Newfoundland Fluorspar, a wholly-owned subsidiary of Aluminum Company of Canada, is planning to expand the operation of its Burin Peninsula mines by 50 percent—from 75,000 tons annually to 110,000 tons.

Coming Events

December 4-5, 1957—New York. Annual meeting, Asphalt Institute. New York Athletic Club.

January 19-23, 1958 — Chicago. Convention and exposition, National Association of Home Builders. Conrad Hilton and Sherman Hotels and the Coliseum.

January 20-23, 1958—Washington, D.C. 13th annual convention, National Agricultural Limestone Institute. Hotel Statler.

January 20-23, 1958—Washington, D.C. 56th national convention, American Road Builders Association. Sheraton Park Hotel.

January 24, 1958—Washington, D.C. Third annual convention, National Crushed Limestone Institute. Hotel Statler.

January 26-30, 1958— Chicago. 39th Annual Meeting, Associated Equipment Distributors. Conrad Hilton Hotel.

February 3-6, 1958—Las Vegas, Nev. Third annual convention, National Bituminous Concrete Association. Flamingo Hotel.

February 9-12, 1958 — Washington, D. C. 8th annual convention and show, Mason Contractors Association of America. Sheraton-Park Hotel.

February 10-13, 1958—Chicago. 42nd annual convention and exposition, National Sand and Gravel Association. Conrad Hilton Hotel and Chicago Coliseum.

February 10-13, 1958—Chicago. 28th annual convention, National Ready Mixed Concrete Association. Conrad Hilton Hotel and Coliseum.

February 10-13, 1958—Dallas, Texas. Annual meeting, Associated General Contractors of America. Hilton-Statler Hotel.

February 10-14, 1958—St. Louis. Committee Week, American Society for Testing Materials. Hotel Statler.

February 11-12, 1958—Chicago. Annual meeting, National Association. Blackstone Hotel.

February 17-19, 1958—Chicago. 41st annual convention, National Crushed Stone Association. Conrad Hilton Hotel.

February 17-20, 1958—Chicago. 38th annual meeting, National Concrete Masonry Association. Sherman Hotel.

February 24-27, 1958—Chicago. Annual meeting, American Concrete Institute. Morrison Hotel.

Sept. Building Contracts Show 2 Percent Increase—9-Month Total Also Rises

September contracts for future construction in the United States totaled $2,624,928,000, an increase of 2 percent over September, 1956, according to the F. W. Dodge Corporation.

Dollar volume of residential contracts in September amounted to $1,151,294,000, an increase of 10 percent, compared to the like 1956 monthly total.

Increased activity in contracts for one- and two-family houses accounted for a great part of the gain in dollar volume in the total residential category.

Dodge contract figures for September, for the first time this year, reported a gain in the number of single-family houses. The 71,102 units in September were 3 percent above the figure for September a year ago.

The total number of dwelling units contracted for in September amounted to 86,397, an increase of 7 percent, compared to September, 1956.

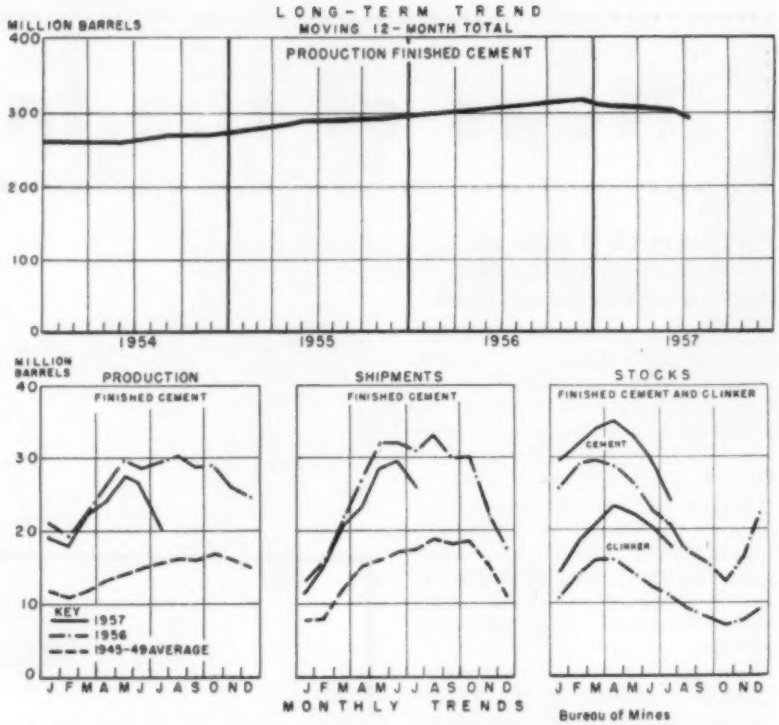
Dollar volume of non-residential contracts in September amounted to $940,864,000, an increase of one percent over the same month a year ago. Contracts were up for commercial, educational and science, social and recreational, and public buildings.

Heavy engineering contracts in September totaled $532,770,000, a decrease of 11 percent, compared to the corresponding 1956 month. Although dollar volume of contracts was up for street, highways, and bridges, decreases in contracts in other heavy engineering sub-categories accounted for the loss.

The cumulative total of contracts for future construction in the first nine months of 1957 amounted to $25,301,580,000, an increase of 2 percent over the comparable period of 1956. Dollar volume of non-residential building contracts for the three-quarter period totaled $8,880,534,000, an increase of 3 percent above the same period a year ago.

Residential contracts for the nine-month period at $10,205,058,000 were practically unchanged from a year ago; but the cumulative total of 778,548 dwelling units was 6 percent below the like 1956 period.

However, heavy engineering contracts for the first nine months of 1957 totaled $6,215,988,000 an increase of 5 percent over the 1956 January-September period.



SUMMARY—Production of finished portland cement in July, 1957, as reported to the U. S. Bureau of Mines totaled 20,287,000 bbl., a decrease of 31 percent from July, 1956. Mill shipments in July, 1957, totaled 25,655,000 bbl., a decrease of 18 percent compared with July, 1956. Stocks of 24,345,000 bbl. of finished portland cement on hand July 31 1957, were 18 percent more than those on hand July 31, 1956. Clinker production during July, 1957, totaled 17,457,000 bbl., a decrease of 38 percent from the July, 1956, figure.

PRODUCTION—One hundred and thirty-two (132) plants in 37 states and Puerto Rico reported a production of 20,287,000 bbl. of finished portland cement during July, 1957, compared with 29,498,000 bbl. in July, 1956. The cement strike hit hardest during the month of July, when 50 out of 94 plants were shut down east of the Mississippi River and 18 out of 69 west of the Mississippi River.

Clinker production during the month of July, 1957, was 17,457,000 bbl., compared with 28,230,000 bbl. during the same month last year.

High-early-strength portland cement production in July, 1957, of 214,000 bbl. decreased 70 percent from the July, 1956, production.

Production of prepared masonry cement was 680,000 bbl. during July, 1957, a decrease of 49 percent from the July, 1956, production.

SHIPMENTS—Mill shipments of finished portland cement for July, 1957, totaled 25,655,000 bbl., compared to 31,333,000 bbl. in July, 1956.

In July, 1957, shipments were higher in eleven (11) districts and lower in twelve (12) districts than in July, 1956. The greatest increases were in the Ohio, Louisiana-Mississippi, and Puerto Rico districts. The greatest decreases were in the eastern Pennsylvania-Maryland, New York-Maine, and the Georgia-Florida districts.

Mill shipments of high-early-strength portland cement totaled 596,000 bbl. in July, 1957, a 41 percent decrease from the 1,014,000 bbl. shipped in July, 1956. No shipments were made from mills in Puerto Rico.

Mill shipments of prepared masonry cement in July, 1957, totaled 1,033,000 bbl., a decrease of 29 percent from the 1,457,000 bbl. shipped in July, 1956. Nearly two-thirds of these shipments were from mills in the northern states east of the Mississippi River. Prepared masonry cements are shown in 376-lb. barrels, although they are sold in barrels of varying weights.

STOCKS—Mill stocks of 24,345,000 bbl. of finished portland cement were on hand July 31, 1957, an increase of 18 percent over the 20,598,000 bbl. on hand July 31, 1956. Stocks of clinker increased 60 percent from 11,059,000 bbl. on July 31, 1956, to 17,674,000 bbl. on July 31, 1957.

FIRST SEVEN MONTHS—For the January-July period this year, the volume of production of finished cement amounted to 157,990 tons, compared with 178,413 tons in the same period of 1956. Total shipments for the first seven months of 1957 are reported as 154,724 tons; in 1956 (January-July period) the total shipments were 173,627 tons.

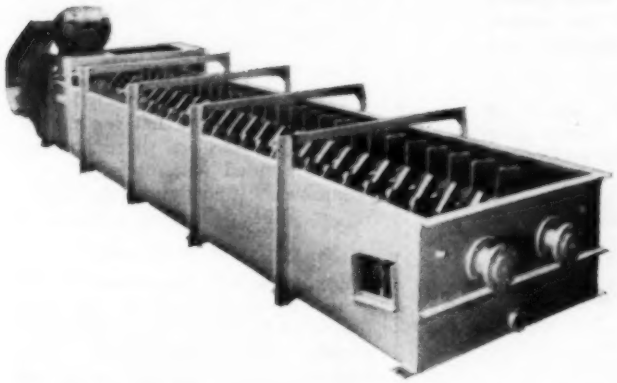
Boone Quarries Plan Move To 160-Acre Site in Missouri

Boone Quarries, Inc., Columbia, Mo., plans to move this winter to a recently purchased 160-acre tract of land near the Columbia airport. More extensive resources and greater ease in quarrying dictate the move.

The company has been in business since 1946 on land leased from John N. Fellows, who had started operations at the quarry in 1902.

4 EAGLE LOG WASHERS

PROCESS CRUSHED ROCK AT BROOKSVILLE (FLA.) ROCK CO.



Eagle Log Washers need no pampering — they're plenty tough! Non-deflecting tubular steel log shaft; marine type, water-lubricated bottom end bearings; Timken bearings at upper end; sturdy steel paddles with renewable corrugated face Ni-Hard chromium-nickel alloy iron shoes; positive, oil-bath, gear drive; 36" and 48" log diameter; 20', 24' and 30' tub lengths. They more than pay their way every working day! Send for Catalog.

BROOKSVILLE ROCK CO., Brooksville, Fla., processes "mountains" of crushed rock with four Eagle 36" dia. x 30' Log Washers. Each pair of washers processes a different size gradation. Two washers are handling minus 2" from the primary crushers and two are handling minus 2" from the impact crusher, and an Eagle Coarse Material Washing-Dewatering Screw is handling minus ⅜" to 10 mesh crushed rock.

These Eagle Log Washers, respected by the industry, scrub and abrade Brooksville's crushed rock to definite cleanliness. They are pleased with the results and their customers like the product.

SINCE 1872

EAGLE IRON WORKS

Engineers • Manufacturers

133 HOLCOMB AVE., DES MOINES, IOWA

EIW

EAGLE IRON WORKS

Hercules Cement Corp. Adds to Storage Capacity With 10 Cement Silos

Construction is nearing completion on ten huge cement storage silos, each 160 ft. high and capable of holding 200,000 to 250,000 bbl. of bulk cement, at the Hercules Cement Corp. plant in Stockertown, Pa.

Work on the project, which was begun early this summer, is scheduled to be finished by the end of the year. General construction contractor for the job is E. C. Machin, Inc., Allentown, Pa.

The addition of the silos is a part of the company's expansion and improvement program, launched about 7 years ago.

Missouri Portland Cement Company, St. Louis, Mo., reported net income for the 9 months ended September 30, 1957, of $2,254,093 or $3.03 per common share, compared with $2,980,536 or $4.01 per share in the comparable period in 1956. Net sales for the like period in 1957 amounted to $13,737,036; in 1956, $15,608,583.

Announcing.....

THE NEW PORTLAND CEMENT PLANT MAP

The new Portland Cement Plant Map so many of you have been waiting for is now available and ready for distribution.

It is 34 inches high by 40 inches wide and printed on sturdy 60 pound stock, making it ideal for hanging on an office wall or placing under the glass top of your desk. Each producing plant is listed alphabetically, by state and city. This list covers the plants in the United States, Canada, Mexico, Cuba and Puerto Rico. These plants are also indicated on the geographical map. Also included in the information on each plant is the plant's producing capacity at the end of 1957, and its estimated capacity at the end of 1958, if the plant is planning to expand; the process used to manufacture each plant's cement . . . wet or dry; and the brand names of the cement each plant produces. New plants under construction and grinding plants also appear in this group.

In addition, portland cement distributing plants located in the United States, Canada, Mexico, Cuba and Puerto Rico appear in a separate list and are also shown on the geographical map.

These maps may be purchased for the following quantity prices:

NUMBER OF MAPS	PRICE
1 — 10	$1.00 each
11 — 25	.75 "
over 25	.50 "

Just tell us the number of maps you want by submitting your request on your regular company letterhead. You can either send along your check or request to be billed later; either way is suitable to us.

PIT & QUARRY PUBLICATIONS, INC.

431 S. Dearborn St. Chicago 5, Ill.

Marquette Cement Wins Gold Oscar of Industry For Best Annual Report

Marquette Cement Manufacturing Company of Chicago, Ill., won the Gold Oscar of Industry in the *Financial World* magazine's annual report contest, thus becoming the first to win the award twice in the 17-year history of the competition.

John M. Budd, president of Great Northern Railway, last year's winner, presented the trophy to W. A. Wecker, president of Marquette, at a dinner held at the Hotel Statler in New York, N. Y., and attended by 1,200 of the nation's leading industrialists.

Marquette won its first Gold Oscar in 1948. The firm has also received 16 other awards over the years for superior reporting, including 3 silver trophies for best of manufacturing company reports, and 13 bronze Oscars for best report in the cement industry.

Alpha Portland Cement Earnings Cut by Strike, Flood

Alpha Portland Cement Company, Easton, Pa., reported a net income of $3,221,804, equal to $1.83 a share, for the 9 months ended September 30, 1957. This compares with $4,575,768 or $2.60 in the like 1956 period. In 1957 net sales totaled $23,720,730; in 1956, $26,778,682.

The sharp decline in earnings in the third quarter was largely due to a strike which shut down the company's eight plants during most of July and a flood which kept the company's St. Louis plant closed for another month and a half.

Nazareth Cement Company, Nazareth, Pa., reported net income of $652,390 or $2.11 a share for the 9 months ended September 30, 1957. Comparable 1956 figures are $901,571 or $2.91 a share.

Production of limestone is expected to begin soon at the new quarry of Meadow Rock Company, Meadow, Nebr. Plans have been made for a spur rail line which will accommodate 40 freight cars. Output will be approximately ten cars per day.

A fire recently destroyed half of the screening plant of the Orange Quarry Company, West Orange, N. J., and caused approximately $300,000 damage to machinery.

American Stock Exchange Lists Maule Industries Common Shares on Board

Listed on the American Stock Exchange board recently were the 745,677 common shares of Maule Industries, Inc., making the Miami-based building supplies concern one

F. K. Foster, president of Maule Industries, Inc., inspects the American Stock Exchange board which now lists the company's common shares. At the left is Oscar Isaacson of the investment brokerage firm of Merrill Lynch, Pierce, Fenner and Beane.

of four Florida firms whose stock is listed on the large boards.

The company, started by Evert Price Maule in 1913 as a rock-crushing operation, now is claimed to be the largest builders' supply industry in the state and the largest manufacturer of concrete block in the world. Jose Ferre, Puerto Rican industrialist, who took over the business in 1954, is chairman of the board.

Maule employs 1,200 men and owns enough land to produce all the rock the firm needs for 60 years. Sales in 1956 amounted to nearly $23,000,000.

12th A.S.T.M. Photo Exhibit Scheduled with 1958 Meeting

According to a release issued by the American Society for Testing Materials, the twelfth technical photographic exhibit of the organization will be held in conjunction with its sixty-first annual meeting and thirteenth exhibit of scientific and testing apparatus and laboratory supplies at the Hotel Statler, Boston, Mass., June 23-27, 1958.

This biennial exhibit has become one of the foremost technical photographic shows in the country. Entries will be accepted from all members of A.S.T.M. and from employees of company members.

The following classes of photographs will be displayed: general, photomicrographs and electron micrographs. Black and white, color prints, and color transparencies will be shown. Special attention will be given to the sections on photomicrography and electron micrography. To be accepted, entries must be informative in their particular technical field.

Further information regarding conditions of entry and applications may be obtained from E. W. Walsh, chairman, A.S.T.M. Photographic Exhibit, The Narragansett Electric Co., 15 Westminster St., Providence, R. I., or the headquarters of the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

Bessemer Limestone and Cement Company, Youngstown, Ohio, increased its net profit for the 9 months of 1957 from $1,031,644 or $2.82 per common share in the 1956 period to $1,856,564 or $5.09 per share. Sales for the 9 months of 1957 were $9,634,665, against $6,764,958 in 1956.

It's Here!

BRAND NEW

LIGHTWEIGHT AGGREGATE PLANT MAP

Our newest combination map and listing is a *must* to anyone interested in the lightweight aggregate field. All lightweight aggregate plants known to be in existence are listed alphabetically, by state. In addition, the plant's address and the brand name of the lightweight aggregate it produces is given.

The map itself assists in graphically pinpointing the actual geographical location of all of the lightweight aggregate producing plants.

This combination map and listing is 25½ inches wide and 22 inches high. The sturdy paper stock it's printed on makes it ideal for framing or pasting on any flat surface.

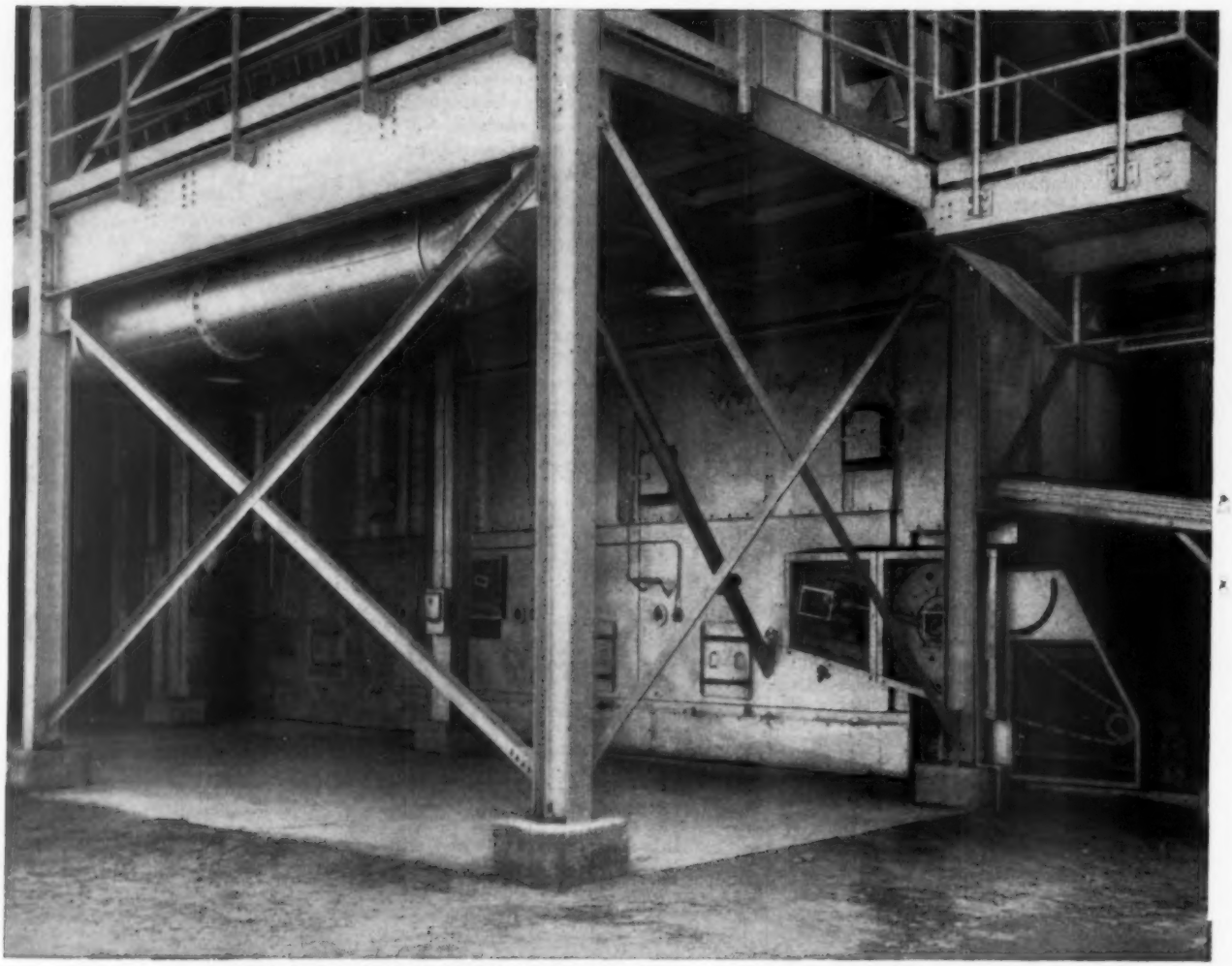
The following are the quantity prices charged for this map.

QUANTITIES	PRICE
1 — 10 maps	35¢ each
11 — 20 "	30¢ "
over 20 "	25¢ "

We will be happy to fill your order for any number of maps you may desire.

PIT & QUARRY PUBLICATIONS, INC.

431 S. Dearborn St. Chicago 5, Ill.



Side view from feed end of a 7′ x 44′ horizontal cooler, designed for cooling 4000 barrels of Portland cement clinker per day, showing crank type grate drive.

Announcing...

the FULLER HORIZONTAL-GRATE

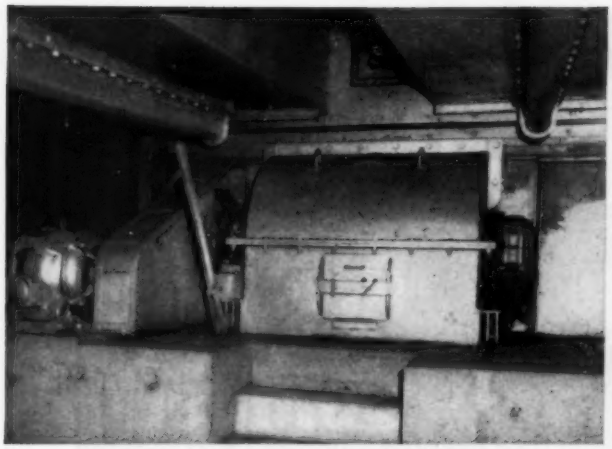
The new Fuller Horizontal-Grate Cooler is a further development and outgrowth of the Fuller Inclined-Grate Cooler, so successfully applied to the cooling of Portland cement clinker and other rotary kiln products in the chemical-process industry, hundreds of which are today in successful operation. Without doubt, this latest development will meet with the same high degree of acceptance and success as its predecessor. Two units are now in operation — twelve more are under construction. Above is a horizontal unit installed in a southern cement plant.

We will, of course, continue to manufacture both types of coolers, enabling us to furnish equipment best suited to meet varying conditions encountered in many plants.

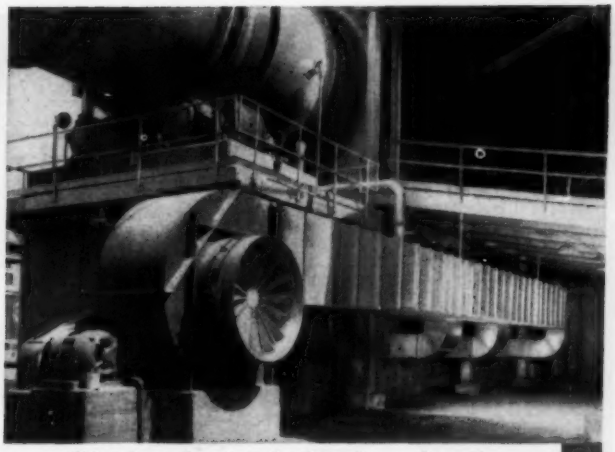
Pertinent features of the Fuller Horizontal-Grate Cooler, are:

Requires a minimum of headroom
Short length if necessary
Improved efficiency of cooling
Better control of secondary air temperature
Increased grate life
Less refractories
Shorter erection time

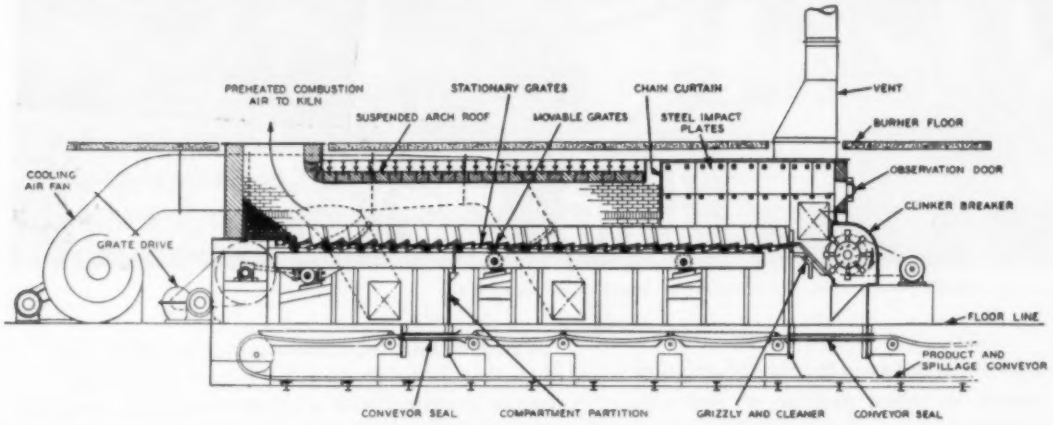
See Chemical Engineering Catalog for details and specifications.

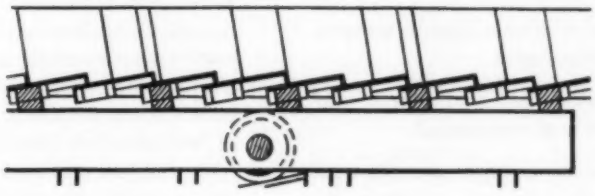


Discharge end of cooler equipped with heavy-duty clinker breaker; vent duct to stack.



Side view of cooler showing air supply and distributing ducts to undergrate air chamber.





COOLER

The improved and more rapid overall distribution of material on the grate of the horizontal cooler permits the use of a short, wide cooler, where length is limited. Improved air diffusion increases the efficiency of the cooler and contributes toward better secondary air temperature control.

Power and air requirements of either cooler are substantially the same.

FULLER COMPANY GENERAL AMERICAN TRANSPORTATION CORPORATION

Fuller

. . . . pioneers in harnessing AIR

CO-32T
4482

FULLER COMPANY

100 Bridge St., Catasauqua, Pa.

SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION

Birmingham • Chicago • Kansas City • Los Angeles • San Francisco • Seattle

HEYL & PATTERSON Rotary R. R. Car Dumper

one . . . man
. . . spotting
. . . minute
} and your railroad car is completely unloaded and contents weighed

View of the Dumper at Buffington, Indiana Plant, Universal Atlas Cement Company.

- Dumper is designed to rotate, dump and return to initial position in just one minute.
- Rotation can be stopped instantly at any position with car and platen firmly held in place.
- External and movable counterweights have been eliminated.
- Platen-mounted electronic scale is simple, accurate and economical.
- Car retarder on dumper permits economical and safe car spotting by dumper operator.

To achieve the most economical car weighing and dumping operation, the H & P Rotary Car Dumper can be equipped with a car retarder or an electronic scale, or both. This H & P electronic scale platen (Patent Pending) uses load cells which permit instant weighing and light-weighing of car in compliance with National Bureau of Standards acceptance tolerance, and printing of weigh tickets. Exceptional accuracy and trouble-free operation are assured due to absence of wearing parts.

By all standards, the H & P Rotary Dumper is the most efficient method of unloading large quantities of bulk materials from open-top railroad cars.

Even if you receive only a relatively small number of cars per day, may we suggest that you investigate the economics of the H & P Rotary Railroad Car Dumper.

MAIL COUPON TODAY FOR NEW DUMPER BROCHURE 957

HEYL & PATTERSON, INC., 55 Fort Pitt Blvd., Pittsburgh 22, Pa.
Please send me my copy of the H & P Dumper Brochure 957.

Name _____ Title _____
Company _____
Address _____
City and State _____

70 YEARS OF SERVICE

Heyl & Patterson
INC.

1956 Aglime Consumption Gains 5 Percent Over 1955 Largest Increase in South

For the second consecutive year, agricultural liming consumption increased over the preceding year by about 5 percent, or nearly 1,000,000 tons. This is an increase of about 12 percent over two years ago, but still 37 percent below the peak liming year of 1947.

The largest percentage and tonnage increase occurred in the southern states; all states except drought-afflicted Oklahoma showed increases. Sharpest gains occurred in Tennessee, Alabama, and Mississippi and secondarily South Carolina and Florida. The biggest tonnage increase of all states, however, was in Wisconsin—up 240,000 tons. Other states making substantial gains were Pennsylvania, North Carolina, Indiana, Michigan, Illinois, and Washington. The greatest loss occurred in Iowa, where liming decreased by 340,000 tons.

The perennial liming leader, Illinois, still leads all states with 2,800,000 tons, with Indiana a close second at 2,550,000 tons. The next four states—also from the Middle West—in order were Missouri, Ohio, Wisconsin, and Iowa.

National Gypsum Company, Buffalo, N. Y., reported 9-month net earnings of $9,915,113 or $2.50 a common share, compared with $11,881,580 or $3.08 a share last year. Sales for the same period in 1957 totaled $107,514,671 as against $119,016,749 in 1956.

St. Lawrence Cement Co. Plans $10 Million Operation At Dundee, Mich., Site

Plans for a proposed $10,000,000 cement plant near Dundee, Mich., were revealed recently to a group of Monroe County residents. Company spokesmen explained that construction is contingent on a request to close five county roads in the area.

Disclosure of the nature of the proposed operation ended months of speculation after an unnamed firm began acquiring 1,400 acres of land. It had been assumed that a chemical plant would be built.

Denis Temple of Clarkson, Ont., financial adviser for the St. Lawrence Cement Company, Clarkson, Ont., Canada, announced that the Dundee operation will be known as the Dundee Cement Company.

28th Consecutive Annual Survey

APPROXIMATE CONSUMPTION OF LIMING MATERIALS ON UNITED STATES FARMS DURING 1956

by National Lime Association, Washington 5, D. C.

State (1)	Agricultural Limestone (2) (Tons)	Burned Lime (Tons)	Hydrated Lime (Tons)	Marl (Tons)	Miscellaneous Materials (3) (Tons)	Total Liming Materials (Tons)
Maine	50,000	--	3,000	--	--	53,000
New Hampshire	27,000	--	--	--	--	27,000
Vermont	79,000	--	500	500	--	80,000
Massachusetts	53,500	--	2,500	--	--	56,000
Rhode Island	7,000	--	--	--	--	7,000
Connecticut	33,000	--	2,000	--	--	35,000
New York	680,000	--	10,000	--	14,000	704,000
New Jersey	67,500	1,500	16,500	--	500	106,000
Pennsylvania	1,031,000	17,000	43,000	--	12,000	1,103,000
NORTHEAST	2,048,000	18,500	77,500	500	26,500	2,171,000
Delaware	48,000	6,000	6,000	--	--	60,000
Maryland	199,000	40,500	15,000	14,000	24,500	293,000
West Virginia	149,000	6,000	3,000	20,000	2,000	180,000
Virginia	482,000	7,000	6,000	40,000	15,000	550,000
North Carolina	410,000	--	--	--	--	410,000
Kentucky	1,370,000	--	--	20,000	--	1,390,000
Tennessee	553,000	1,000	1,000	--	15,000	570,000
EAST CENTRAL	3,211,000	60,500	31,000	94,000	56,500	3,453,000
Ohio	1,908,000	--	32,000	4,500	51,500	1,996,000
Indiana	2,495,000	--	1,000	46,000	5,000	2,547,000
Michigan	400,000	--	--	200,000	--	600,000
Illinois	2,612,000	--	--	--	200,000	2,812,000
Wisconsin	1,550,000	--	--	20,000	30,000	1,600,000
Minnesota	450,000	--	--	3,000	--	453,000
Iowa	1,420,000	--	--	--	--	1,420,000
Missouri	2,210,000	--	--	--	10,000	2,220,000
NORTH CENTRAL	13,045,000	--	33,000	273,500	296,500	13,648,000
South Carolina	140,000	--	--	--	--	140,000
Georgia	321,000	1,000	--	--	--	322,000
Florida	575,000	--	2,000	--	3,000	580,000
Alabama	298,000	--	--	2,000	90,000	390,000
Mississippi	302,000	--	--	--	25,000	327,000
Louisiana	136,000	--	--	--	--	136,000
Arkansas	250,000	--	--	--	--	250,000
Oklahoma	50,000	--	--	--	--	50,000
Texas	105,000	--	--	--	--	105,000
SOUTHERN	2,077,000	1,000	2,000	2,000	118,000	2,200,000
Kansas	370,000	--	--	5,000	--	375,000
Nebraska	210,000	--	--	--	--	210,000
Washington	30,000	--	--	5,000	--	35,000
Oregon	51,000	--	1,000	--	2,000	54,000
California	10,000	--	2,000	--	10,000	22,000
WESTERN	671,000	--	3,000	10,000	12,000	696,000
GRAND TOTALS	21,052,000	80,000	226,500	380,000	509,500	22,248,000

(1) States not listed use little or no liming materials. Sources of statistics shown: (a) Production & Marketing Adm., U.S.D.A.; (b) Agricultural Experiment Stations; (c) State Extension Services; (d) State Departments of Agriculture; (e) County Agent Surveys; (f) Producers Surveys; (g) Farm Census.

(2) Includes all ground and pulverized forms of limestone (screenings, coarse and fine types) which are used for direct application to the soil (limestone in fertilizers not included).

(3) Consists of ground mollusk and egg shells, paper and sugar mill refuse, slag, lead mine chats, water softening sludge, and carbide refuse.

On a lime oxide (active liming ingredients) basis, the total 1956 U. S. consumption of 22,248,000 tons is estimated at 11,120,000 tons.

• Developments in cement producing equipment were studied by representatives of the Onoda Cement Co., Ltd., Japan, during their visit to this country recently.

Shown during a conference at Allis-Chalmers West Allis Works are (seated): T. Nakao, director and manager of the Yahata plant of Onoda Cement; Mrs. Ando; T. Ando, president of Onoda Cement; and Paul Dietz, associate director of sales, engineering products, Allis-Chalmers International. Standing: T. Oishi, representative from the New York office of Daiichi Bussan Kasei; J. C. Warner, territorial sales manager, engineering products, in middle and east Asia, Oceania, Allis-Chalmers International; and T. Fujimaki, engineer, Onoda Cement.

George Gates Robinson, Canadian Industrialist, Dies Unexpectedly at 66

George Gates Robinson, 66, president of Standard Paving and Materials Ltd., Toronto, Ont., died unexpectedly on October 25.

He was born in Weedsport, N. Y., and graduated in civil engineering from Cornell University in 1914. Until 1916, he was associated with Portland Cement Ltd., and until 1919 with the Canada Cement Association, Montreal.

Mr. Robinson was a past president of the Ontario Road Builders' Association and also of the Canadian Construction Association. Since 1929 he has been a director of Standard Paving and Material Ltd., and in 1946 he became president and chairman.

He was also a president of Concrete Pipe Ltd., Consolidated Sand and Gravel Ltd., National Sand and Gravel Co. Ltd., and vice-president of National Slag Ltd.

Tinflo To Begin Producing Agricultural Lime in Tenn.

Tinflo, a new concern, will begin commercial production of agricultural lime in December on 800 acres of leased land in the Algood-Brotherton area of Putnam County, Tenn.

Total investment in the project is estimated to be between $2,000,000 and $3,000,000. Initially, 25 persons will be employed. The company was organized by John H. Campbell of Ft. Lauderdale, Fla.

Arc Welding Manual Issued By Lincoln Electric Company

The second revised edition of *New Lessons in Arc Welding*, published by the Lincoln Electric Company, Cleveland, Ohio, is now available.

The 32-page book includes information on new procedures, machines, electrodes, and teaching methods for manual arc welding.

Copies are available from the Lincoln Electric Company, Cleveland 17, Ohio, at $1 per copy, postage prepaid in the United States, and $1.50, postage prepaid elsewhere.

Keystone Portland Cement Company, Philadelphia, Pa., reported net income of $1,346,506 or $2.47 a share for the 9 months ended September 30, 1957. In 1956 income for the comparable period was $1,361,338, equal to $2.49 a share. Net sales in 1957 totaled $9,488,466; in 1956, $9,732,407.

13th Annual N.A.L.I. Convention Program

Hotel Statler, Washington, D. C., Jan. 22-23

WEDNESDAY, JANUARY 22
MORNING SESSION
FEDERAL ROOM

President—Chairman of the Board Russell W. Hunt
Registration—Foyer of FEDERAL ROOM
9:00 a.m.—Movie — "New England Green Pastures"—New England Green Pastures Committee with the co-operation of the National Plant Food Institute
9:30 a.m.—Call to order and welcome by the chairman of the board
Reading of minutes of previous meeting
Treasurer's Report—J. B. Mount
Committee reports by chairmen:
By-laws—Leo L. Davis
Convention Arrangements—C. A. Munz
Finance and Budget—J. B. Mount
Legislative and Public Relations—W. O. Faylor
Membership—William E. Stone
Tax—Kenneth W. Horne
Promotion and Education—Arthur R. Alvis
State Association—Earl D. Werner
Old Business
New Business
11:30 a.m.—Presentation of the promotional materials and services available to members of the Institute—Samuel Omasta, vice-president, N.A.L.I.

GREETING LUNCHEON—12:30 p.m.
CONGRESSIONAL ROOM

Presiding—W. M. Palmer Jr.
"Where to in 1958?"—Robert M. Koch, president, N.A.L.I.

AFTERNOON SESSION—2:30 p.m.
FEDERAL ROOM

Discussion on Operations

EVENING
CONGRESSIONAL ROOM

6:00 p.m.—Reception
PRESIDENTIAL BALLROOM
7:00 p.m.—Banquet
Presiding—Chairman of the Board, Russell W. Hunt
"Conservation and the Nation's Farm Programs"—by the Hon. Harold D. Cooley, Congressman from North Carolina

THURSDAY, JANUARY 23
MORNING SESSION
FEDERAL ROOM

9:00 a.m.—Movie—"Dawn of a New Day"—Georgia Extension Service
Panel on Promotion—Presiding Chairman, Arthur R. Alvis
Participating—R. O. Bemis, Charles S. Bryan, E. R. Culbertson, Jack Pearce

MANUFACTURERS' DIVISION MEETING
CALIFORNIA ROOM—10:30 a.m.
Chairman—Ralph C. Johnson

LUNCHEON—12:30 p.m.
CONGRESSIONAL ROOM

Presiding—William E. Stone, vice-chairman of the board
"Public Relations—Good and Bad"—by Win Pendleton

AFTERNOON SESSION—2:30 p.m.
FEDERAL ROOM

Group discussion on the agricultural conservation program

EVENING
MANUFACTURERS' DIVISION
GUEST NIGHT
PRESIDENTIAL BALLROOM—6:00 p.m.
Buffet Dinner—Dance

FORD GIVES YOU MORE FOR '58

NEW FORDS GIVE

NEW FORD POWERMASTER

...MORE EASE OF HANDLING

Work-easy power steering is available for all Ford Tractors to give fingertip steering control even in curbed areas, on soft ground or over rough terrain. Ford's power steering* gives 90% assist — leaves just enough manual control for the operator to retain "feel" of the wheel. No steering wheel kick-back, no lost motion . . . and the sharp reduction in operator fatigue shows up dramatically in the form of increased production!

*Standard on Row Crop Models. Optional on others.

EFFORTLESS, ONE-HAND STEERING		
TRACTOR LOAD	STEERING WHEEL TORQUE—FT.-LBS.	
	Power Off	Power On
Empty Loader	35 to 95	3 to 9
1000 lb. bucket load	100 lbs.-plus, according to terrain	5 to 9

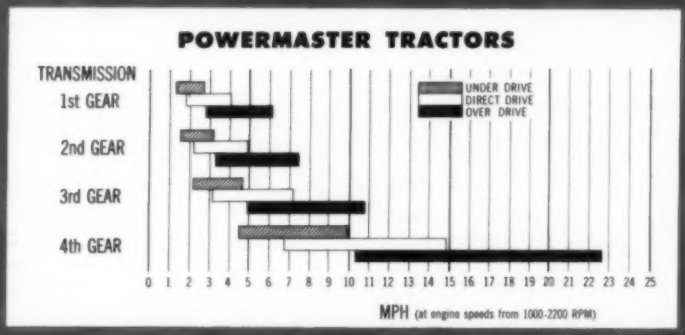
YOU MORE POWER...

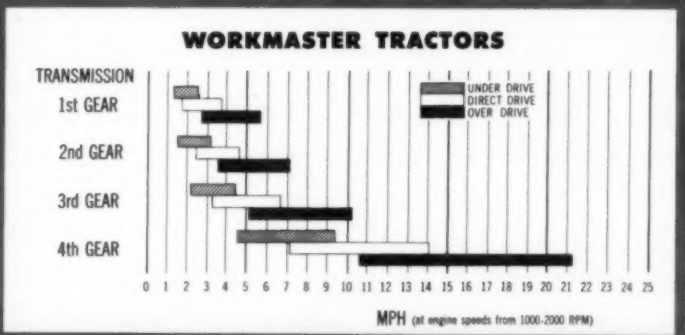
MORE SELECTION

NEW FORD
WORKMASTER

The most powerful Ford Tractors ever! There's a wide choice of new Ford All Purpose Tractors — in both the economical Workmaster series and the husky Powermaster series. Ford's new All Purpose Workmasters and Powermasters give you full range of equipment selection . . . from the Special Utility models, lowest cost work horsepower on the market, right on up through the fully equipped deluxe Model 861 Powermaster. All new Ford Tractors are available in gasoline or LP-Gas models. There's no waste investment for unneeded "frills" with the new Ford Tractors. Buy horsepower, weight and equipment to exactly fit *your* job! See your Ford Tractor and Equipment Dealer — or write Industrial Department, Tractor & Implement Division, Ford Motor Company, Birmingham, Michigan.

12-SPEED OVER-UNDER TRANSMISSION


POWERMASTER TRACTORS
TRANSMISSION
1st GEAR
2nd GEAR
3rd GEAR
4th GEAR
UNDER DRIVE
DIRECT DRIVE
OVER DRIVE
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
MPH (at engine speeds from 1000-2200 RPM)


WORKMASTER TRACTORS
TRANSMISSION
1st GEAR
2nd GEAR
3rd GEAR
4th GEAR
UNDER DRIVE
DIRECT DRIVE
OVER DRIVE
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
MPH (at engine speeds from 1000-2000 RPM)

. . . MORE MOBILITY

Ford's new Powermasters and Workmasters are available with choice of 4-speed or 5-speed transmissions. Four speed transmission can accommodate an "over-under" auxiliary transmission giving 12-speeds forward, 3 reverse and 3 PTO. They're your answer to any speed need from one-mile-per-hour creeping for finish grading and transplanting to more than 20 mph for fast transport.

Four-speed transmission models also accommodate a reversing transmission for work with a fork lift. All controls are simple, no high-priced "specialists" are needed to operate Ford Tractors and equipment. Any man on your job can keep the work moving on schedule!

NOW POWER STEERING AND "LIVE" PTO

FORDSON MAJOR DIESEL

Power steering and "live" PTO are now being offered as factory options for the Fordson Major Diesel — already famous world over for fuel economy. Power steering adds still more mobility and ease of handling to the FMD, and with live PTO you can make still more use of the tractor's tremendous lugging power and versatile 6-speed transmission. Choose from four special utility and fully equipped models.

Amazing economy — Unbiased tests give dramatic proof of the FMD's amazing economy of operation. Still further savings are offered by FMD "Special Utility" models — work horsepower at a rock bottom price for industrial jobs where no hydraulic system is needed. And the same emphasis on money-saving is also found in Ford's gasoline and LP-Gas model tractors . . . low original investment, low operating cost, low maintenance cost. More of the economy that has always been traditional with Ford! See your Ford Tractor and Equipment Dealer.

YOU SEE MORE FORDS BECAUSE THEY SAVE MORE MONEY!

Government Refused Depletion Case Review By U. S. Supreme Court

The recent denial by the U. S. Supreme Court of the Federal Government's petitions for certiorari on two lower court cases involving percentage depletion allowances is of vital interest to many nonmetallic minerals producers.

As an outgrowth of that denial, the Internal Revenue Service of the Treasury Department has announced that it "is taking steps to dispose of pending litigation and claims involving brick and tile clay and cement rock, as required under these decisions, and to conform Treasury regulations and outstanding rulings accordingly." The announcement also indicated that, "consideration is being given as to the applicability of these decisions in cases involving fire clay and limestone."

In one of the cases, *Dragon Cement Co.* v. *United States*, 244 F.2d 513 (1957), the lower court (First Circuit) held that the processes applied in the production of cement were allowable treatment processes. These included burning of crushed rock and pulverization of the resultant clinker. In the other case, *United States* v. *Merry Brothers Brick and Tile Co.*, 242 F.2d 708 (1957), the Fifth Circuit court allowed tempering, molding, and burning of brick and tile clay in obtaining a commercially marketable product.

Gypsum Production Sags 16 Percent in Second Quarter

Domestic mine production of crude gypsum during the second quarter of 1957, as reported to the U.S. Bureau of Mines, was 2,325,878 short tons—16 percent less than in the second quarter of 1956. Imports declined 11 percent, and the apparent crude supply was down 15 percent. Calcined gypsum, the most accurate overall measurement of activity in the industry, totaled 1,983,245 tons, showing a drop of 16 percent from last year's second quarter.

Sales of uncalcined gypsum products declined 5 percent during the quarter due to a lowering of the demand for portland-cement retarder. Building and industrial plasters were off 9 and 10 percent, respectively, from the corresponding period of last year. All industrial plasters declined, whereas in the building category, increases of 12 and 23 percent were reported for roof-deck and "other" plasters.

Output of all prefabricated gypsum products declined.

● In stripping operations of Edward Kraemer & Son, Inc., at a quarry near Plain, Wis., a Cat D8 tractor with No. 8U-blade was utilized. Here the unit is shown pushing a limestone boulder weighing almost as much as the 40,000-lb. tractor. The rock was pushed approximately 100 yards and dropped into a spoil pit.

Lime Sales in July Show Slight Increase Over June

Domestic sales of open-market lime in July (753,463 short tons) increased slightly over the previous month's output, according to reports of producers to the U. S. Bureau of Mines. Lime for agricultural, chemical, and refractory uses increased, whereas a slight decrease was noted in building lime.

The accompanying table shows sales of lime by types and major uses.

Missouri Limestone Producers Set Meeting for Mar. 24-25

The Missouri Limestone Producers Association will hold its 13th annual meeting on March 24 and 25, 1958, at the Hotel Governor, Jefferson City, Mo.

Included in the program will be lectures on explosives, drilling, safety, preventive maintenance, conveyor belt maintenance, and new quarry equipment.

The Southwestern Portland Cement Company, Los Angeles, Calif., has purchased 752 acres of property located southeast of Fairborn, Ohio, adjoining other Southwestern properties.

Lime Sold by Producers[1] in the United States, in Specified Periods of 1956-57, by Types and Major Uses, in Short Tons

	JUNE 1957	JULY 1957	JULY 1956	JANUARY-JULY 1957	JANUARY-JULY 1956
By types:					
Quicklime	560,424	590,646	366,253	4,195,185	4,066,268
Hydrated lime	161,448	162,817	155,234	1,078,495	1,129,052
Total lime[2]	721,872	753,463	521,487	5,273,680	5,195,320
By uses:					
Agricultural:					
Quicklime	3,750	8,256	10,589	36,549	58,657
Hydrated lime	11,149	8,005	7,258	95,947	99,559
Total lime	14,899	16,261	17,847	132,496	158,216
Building:					
Quicklime	26,247	18,111	14,092	113,910	94,663
Hydrated lime	82,706	83,681	87,115	519,298	577,348
Total lime	108,953	101,792	101,207	633,208	672,011
Chemical and other Industrial:					
Quicklime	351,803	375,527	287,529	2,680,265	2,642,165
Hydrated lime	67,593	71,131	60,861	463,250	452,145
Total lime	419,396	446,658	348,390	3,143,515	3,094,310
Refractory (dead-burned dolomite)	178,624	188,752	54,043	1,364,461	1,270,783

[1] Also includes a small quantity of captive tonnage. The monthly canvass excludes the output of plants producing less than 10,000 tons a year.

[2] Approximately 60 percent of lime produced is high-calcium and 40 percent high-magnesium.

Portable PRIMARY Plant

42″ x 41′ Portable Apron Feeder; 3′9″ x 5′ Heavy Duty Scalping Screen; 30″ x 42″ Jaw Crusher, with 36″ delivery conveyor; 30″ x 54′ Portable Conveyor.

large capacity ...modern

portable

CRUSHING and SCREENING PLANT

of **NELLO L. TEER CO.**, Raleigh, N. C.

TELSMITH EQUIPPED THROUGHOUT—

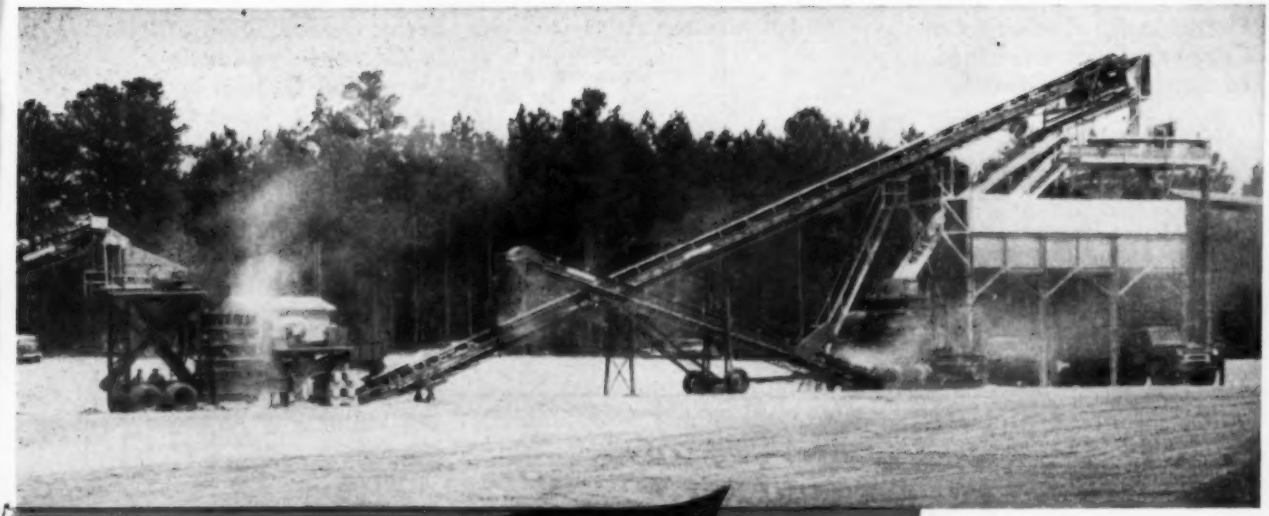
42″ x 41′ Portable Apron Feeder • 3′9″ x 5′ Heavy Duty Scalping Screen • 30″ x 42″ Jaw Crusher with 36″ delivery conveyor • 30″ x 54′ Portable Conveyor • 4′ x 8′ Double Deck Heavy Duty Scalping Screen • 489-S Gyrasphere Crusher • 30″ x 111′6″ Belt Conveyor • 5′ x 12′ Triple Deck Vibro-King Screen • 48-FC Gyrasphere Crusher • 24″ x 54′ Portable Conveyor • Three Steel Bins

---

SMITH ENGINEERING WORKS

504 E. CAPITOL DRIVE **MILWAUKEE 1, WISCONSIN**

Representatives in Principal Cities in All Parts of the World • Cable Address: Songworks, Milwaukee



Portable SECONDARY Plant

4′ x 8′ Double Deck Heavy Duty Scalping Screen; 489-S Gyrasphere Crusher.

MILWAUKEE TELSMITH WIS. U.S.A.

Portable TERTIARY CRUSHER

48-FC Gyrasphere Crusher.

● Owned by Nello L. Teer Co., and operating near Raleigh, N. C., this big capacity, highly mobile Telsmith Portable Crushing and Screening Plant is modern in every detail. It has primary, secondary, and tertiary units. Crushing hard granite, it produces 300 tons hourly of minus 1½″ crusher run; or 200 tons hourly of washed material in 3 sizes: minus 1¼″ plus ¾″, minus ¾″ plus ⅛″, and minus ⅛″—for ready-mix plants and highway construction. Get Complete Plant Bulletin 266.

P-21

TELSMITH®

Permanente Cement Co. Expands Sales Division In Southern California

Permanente Cement Company has completed expansion of its southern California sales division with the addition of five new salesmen.

New salesmen handling the complete line of Permanente Cement products include Dick Balcom, T. W. Richards, Donald R. Youngerman, and Burton P. Lenell. Specializing in sales of plastic cement, used in exterior stucco work by plasterers, is James N. Hentges. At the same time, two former line salesmen, Frank Miller and Denny Matthews, have been shifted to contractor sales.

Permanente began producing in southern California last spring with the completion of its 2,500,000-bbl. capacity plant near Lucerne Valley.

Bituminous Concrete Producers To Meet Feb. 3-6 in Nevada

The third annual convention of the National Bituminous Concrete Association is scheduled for February 3 to 6, 1958, at the Flamingo Hotel, Las Vegas, Nev.

The program will include nationally known speakers, panel discussions, regular business sessions, and the election of officers. Also included will be the finest Hollywood entertainment and activities for ladies.

Convention chairman is John W. Kelly, a member of the N.B.C.A. board of directors. Appointed by President Sheldon G. Hayes and approved by the executive committee, the following members will aid Mr. Kelly in planning the program and details: H. E. Schroeder, D. L. Cheney, Marshall J. Wylie, and F. C. Leffingwell. The committee met on October 25 in Las Vegas to make final plans.

A. R. Fisher Named Chairman Of Johns-Manville Corp.

Adrian R. Fisher has become chairman of the board of the Johns-Manville Corporation, New York, N. Y., in a realignment of executive responsibilities following the retirement of Leslie M. Cassidy, chairman of the board. Mr. Fisher, a member of the firm since 1923, continues as president and a director of Johns-Manville.

Mr. Cassidy, who retired because of ill health, continues as a director, and will be available to the management as a consultant.

Clinton B. Burnett, was elected executive vice-president, a newly-created post, and was made a director of Johns-Mansville.

Harbison-Walker Refractories Company, Pittsburgh, Pa., reported net earnings for the 9 months of this year amounting to $9,978,373 or $3.28 a share, compared with $7,440,794 or $2.45 in 1956.

● At the Crawford Lime and Quarry Company in Cedar Rapids, Iowa, an International 65 Payhauler keeps pace with increased production which follows the installation of an all-electric crusher plant. The Payhauler transports rock and limestone 1,400 ft. from quarry to crusher on a 15 percent upgrade. In this shot a Link-Belt LS-98 shovel is depositing a bucket of stone into the truck.

The one-man electric plant, handled by remote control, has a capacity of 265 tons of ¾-in. stone per hour. The main unit is a Universal 36 x 45 impact crusher which reduces material to 2 in. minus.

The haulage unit has been added since the publication of a story on the Crawford operation in the May, 1957, issue of PIT AND QUARRY.

Brazil Called Self-Sufficient In Cement Production Since Top Output in '56

Brazil's cement industry has boosted capacity and output to the point where it is able to match the nation's growing need for this building material.

The shift from dependence on imports to national self-sufficiency appears to have been accomplished last year when production climbed to 3,300,000 tons.

The four leading cement-producing districts are the states of Sao Paulo, Rio de Janeiro, Minas Gerais, and Pernambuco, in that order. Last year Sao Paulo turned out 908,700 tons, 13 percent more than in 1955, while Minas Gerais had a 75 percent production increase.

Sao Paulo and Rio de Janeiro together use about half the cement produced in the country—about 34,500,000 bags out of 65,000,000.

Overall output is now large enough to allow Brazil to export cement. Bolivia and Paraguay were the first to receive shipments last year.

Symposium on Radiation Announced by A.S.T.M.

The American Society for Testing Materials has announced that *Symposium on Radiation Effects on Materials*, a 196-page publication, is now available.

This symposium is the first of a series sponsored jointly by the A.S.T.M. committee E-10 on radioisotopes and radiation effects and the Atomic Industrial Forum. It was presented at the A.S.T.M. 2nd Pacific Area National Meeting held in Los Angeles, Calif., in September, 1956.

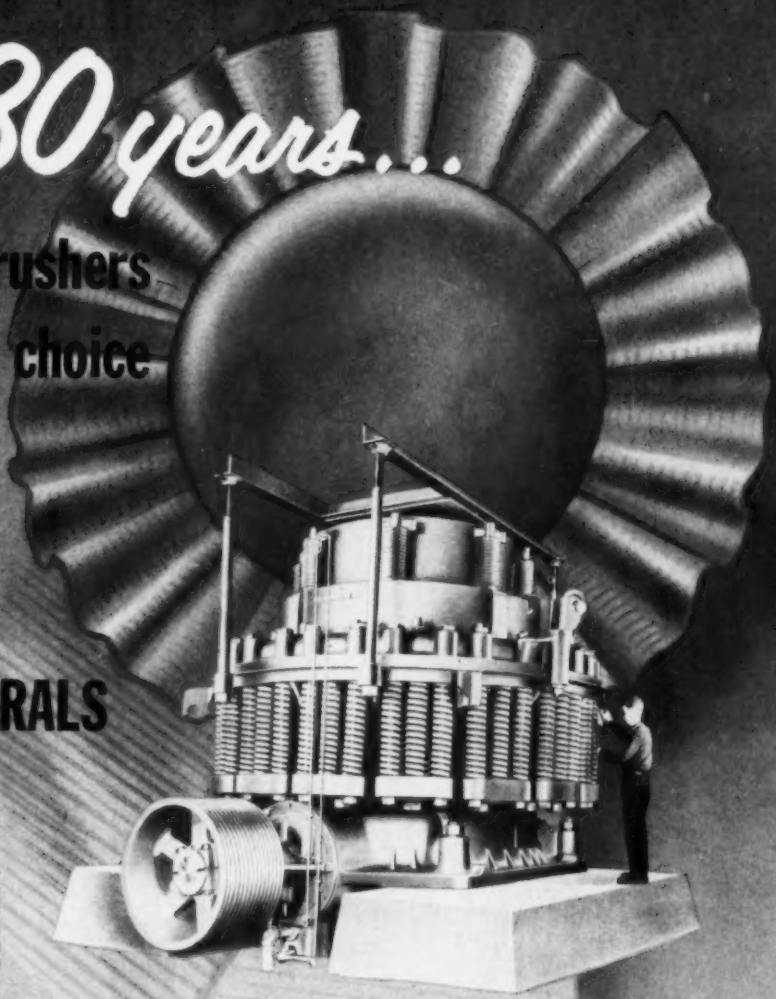
The book is divided into three parts: (1) theory of radiation, (2) radiation facilities and mechanics of testing, (3) experimental tests and results on (a) fuel and graphite materials and (b) structural materials, including organics.

This publication may be obtained from the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa., at $4.75 a copy.

Hercules Cement Corporation, Philadelphia, Pa., announced its income for the 12 months ended September 30, 1957, amounted to $1,619,382 or $2.18 a common share, compared with $1,741,376 or $2.34 a share for the preceding 12 months. Sales for the latest 12 months totaled $11,200,790 as against $11,832,963 of the previous year.

After 30 years...

SYMONS® Cone Crushers are still the first choice of the world's leading producers of ORES and INDUSTRIAL MINERALS



SYMONS CONE CRUSHERS . . . *the machines that revolutionized crushing practice* . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to 900 tons per hour.

The introduction of the Symons Cone Crusher some thirty years ago marked the greatest advancement ever made in the field of reduction crushing. The immediate acceptance of this crusher by producers of finely crushed materials has had no parallel with any type of machinery used for similar service.

The dominant position which the Symons Cone Crusher has so consistently maintained in over a quarter-century of service is positive proof of its vastly superior performance in processing big tonnages of finely crushed product at lower cost . . . *and is the reason why Symons Cones are still the first choice of the world's leading producers for volume crushing of metallic and non-metallic ores and industrial minerals.*

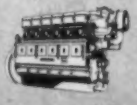
Write for further information.

SYMONS PRIMARY GYRATORY CRUSHERS

NORDBERG GRINDING MILLS

NORDBERG MINE HOISTS

SYMONS VIBRATING GRIZZLIES & SCREENS



NORDBERG ENGINES 10 to over 12,000 H.P.

SYMONS . . . A REGISTERED NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD

© 1957, Nordberg Mfg. Co.

NORDBERG MFG. CO.

C157

MILWAUKEE, WISCONSIN

NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • ST. LOUIS • DULUTH • WASHINGTON

TORONTO • MEXICO, D. F. • LONDON • GENEVA • JOHANNESBURG

Quick connection for better blasting...

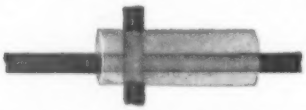
AUSTIN DETONATING FUSE and CONNECTORS

Effective blasting depends upon use of a powerful detonating fuse with proper connection between trunk and lead lines.

That explains why successful strip mines and quarries rely on Austin Detonating Fuse and plastic Connectors. This combination provides a quick hook-up of high strength fuse that won't slip, slide or lose contact in any weather or under any job condition. It also eliminates tying of knots and the resultant possibility of their becoming untied.

Blasting goes according to schedule with Austin Detonating Fuse, for it possesses more than enough power to initiate the entire charge in every hole. Protected with a waterproof covering, it is tough, but flexible . . . won't chip, peel or crack while being laid. It's insensitive to shock, abrasion and stray electrical currents.

AA-4482



First, thread fuse from shot hole through length of connector. Then, press the trunk line into the grooved slots.

Next, return the branch line through the end of the connector on the other side of the trunk line. Pull both ends of branch line tight for positive connection.

USED IN 1833 AUSTIN & EVER SINCE

AUSTIN POWDER COMPANY
CLEVELAND 13, OHIO

explosives ◆ permissible dynamites ◆ mine tools
◆ detonating fuse ◆ AP drill heads ◆ Akremite ◆ primers

Great Lakes Carbon Corp. Starts Expansion Plans With New Perlite Mine

The opening of its No Agua deposit of crude perlite in northern New Mexico marks the first move of an extensive expansion program announced by the Perlite Department of Great Lakes Carbon Corporation's (Los Angeles, Calif.) Mining and Mineral Products Division.

The No Agua deposit, which has been held as reserve by Great Lakes Carbon Corporation for nearly ten years, is said to be the world's largest known deposit of uniform commercial-grade perlite. To exploit this deposit, a new crushing and sizing plant is now being erected at the site. Upon scheduled completion in June, 1958, it will be "the perlite industry's most complete and most modern processing plant for crude perlite," according to D. L. Marlett, vice-president and general manager of the Mining and Mineral Products Division.

Until the new plant goes into operation, the company will process the No Agua perlite ore at its existing plant in Florence, Colo.

Crushed and graded perlite ore from the No Agua deposit is marketed to the perlite-expanding industry under the name of Nu-Alexite. Preliminary tests indicate that Nu-Alexite ore will, in most perlite-expanding furnaces, show a higher production rate and require lower furnace temperatures than the original Alexite ore mined at the company's Rosita (Colo.) deposit. Production of the latter ore is being discontinued since present conditions make its mining and processing economically impractical. The company will continue its other New Mexico operation.

In announcing the new perlite mining operation, Mr. Marlett made it clear that the corporation is not in the business of expanding perlite for sale to the building industry as a bagged aggregate for plaster and concrete.

The Perlite Department of the Mining and Mineral Products Division supplies crushed and graded perlite ore to independent processors and users of perlite and to its 24 franchisees, who process and supply expanded perlite under the Great Lakes Carbon registered trade name, "Permalite."

DANIEL E. SEYMOUR has been named district public relations representative for the Portland Cement Association in Washington and northern Idaho.

Texas Lime Co. Wins Dust Emission Suit

A recent decision handed down by the Texas Supreme Court in litigation involving a lime producer concerned a problem of significance to virtually every operator of a lime plant in the country and to other industries.

The case in point was that of *Lavon Hindman, et al,* petitioners, v. *Texas Lime Company, et al.,* respondents, with the basis of the litigation centered on losses and damages alleged by the petitioners to be incurred as a result of a "dust nuisance" created by the operations of the Texas Lime Company plant at Cleburne, Tex.

The petitioners referred to were primarily comprised of used car dealers who first brought suit in District Court. As noted in the majority opinion of the Supreme Court, the plaintiffs in the first action complained of the emission of lime dust from a plant and kiln owned by Limestone Products Company, but operated by the Texas Lime Co. as lessee. The theory of suit was that these defendants were maintaining a nuisance to the detriment of the plaintiffs' property interests.

After a jury trial, the lower court awarded money recoveries against the Texas Lime Co. for damages. None were granted against Limestone Products, however, nor was a requested injunction granted against Texas Lime Co. as a plant operator. Damages sought by the car dealers were based on expenses allegedly incurred in washing and polishing numerous automobiles, as well as alleged diminution of value due to coatings of lime dust.

The Court of Civil Appeals affirmed that part of the lower court judgment rendered in favor of Limestone Products as well as the order refusing injunction against Texas Lime Co. operations. However, the awarding of damages against the latter was reversed and remanded.

The Supreme Court of Texas, in concluding that the Court of Appeals correctly reversed the damage recoveries awarded pointed out that the plaintiffs elected to claim loss of profits or business detriment occasioned by increased costs of operations and injury to their stocks of merchandise.

Significantly, in illustrative cases referred to by the higher court, damages have frequently been awarded against plant operators on the basis of specific injury to specific items. Here, however, the car dealers presented evidence in support of their contentions in the form of "examples" of some automobiles from which the jury in the District Court could presumably infer the damages resulting to a larger number of cars on which no evidence had been submitted.

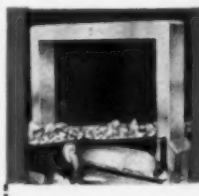
The Supreme Court said that without a showing of some uniformity of damage that could be applied to a substantial portion of the automobiles in question, the "example" method used provides nothing more than a basis for a guess on the part of the jury. In substance. the high court stated that the automobile dealer used the wrong theory of recovery in applying the "stocks of merchandise" approach, and should have alleged damages to specified automobiles. In another trail, the district court would be governed by these holdings.

The original suit was filed on October 13, 1955, and made inquiry as to damages (for the jury's consideration) from the date of October 13, 1953. During the period of litigation, which culminated in the Texas Supreme Court's ruling on October 16 of this year, the Texas Lime Co. has taken comprehensive steps to remedy the dust problem created by various points in the operation. A detailed report on the work done was presented by Dudley F. Woodbridge, general manager, Texas Lime Co., at the recent meeting of the National Lime Association in Austin, Tex. See the report, page 113.

Rock from the quarry that passes through the RCA Metal Detector, pre-set by you for your situation, is automatically inspected for tramp metal. You know the material is safe—safe for your crushers—once it's "on the other side." It's that easy! Thus, dipper teeth, drill bits, and other hard alloy parts—magnetic or non-magnetic—are brought to light! The conveyor automatically stops or the danger zone is marked, even though the trouble makers are hidden from human eyes.

An official of one large company writes: "Our Metal Detector has saved tens of thousands of dollars!" This equipment can easily pay for itself in reduced repairs, downtime, production gains. An RCA Service Company electronics technician supervises installation by your personnel. A low-cost servicing plan provides continuing maintenance.

Get complete information—Mail coupon



MARK OF RCA QUALITY

ELECTRONIC METAL DETECTOR

RADIO CORPORATION of AMERICA
Dept. A-236, Building 15-1, N.J.

☐ Please send me complete data on the RCA Metal Detector.

☐ Have representative call to survey our plant.

NAME_____ TITLE_____

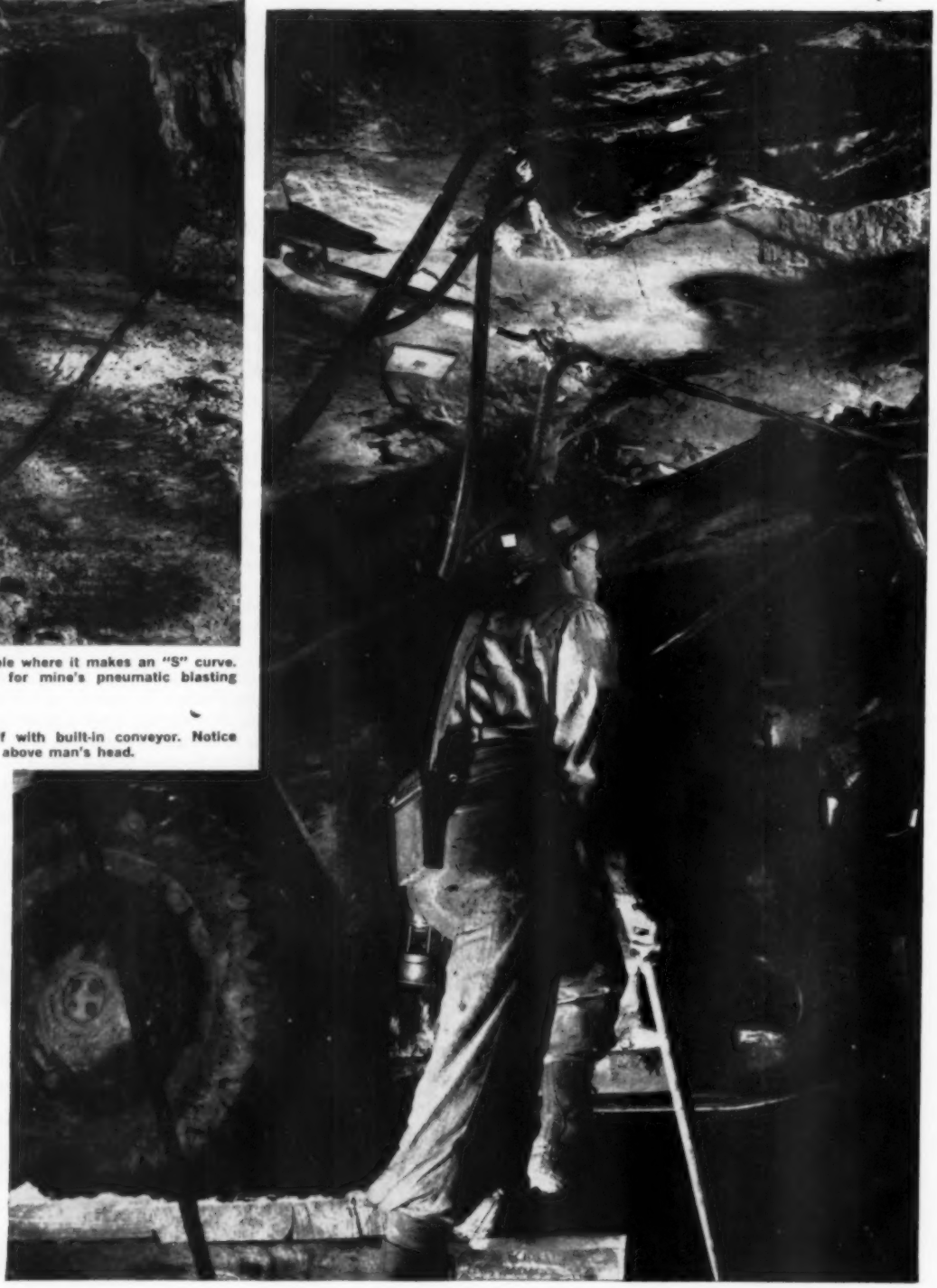
COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

"We increased our cable life

Supervisor checks the cable where it makes an "S" curve. Thin tubing overhead is for mine's pneumatic blasting system.



Shuttle car unloads itself with built-in conveyor. Notice twisted Tiger Brand cable above man's head.

with TIGER BRAND,"

—*says Master Mechanic of a large Pennsylvania mine*

THE mine shown here is clean and modern, but it has just one purpose: to produce coal at a profit under safe working conditions. The mine has about 30 miles of trackway, and produces about 4,500 tons daily. About a dozen shuttle cars are in constant use, between rail heads and working faces that are frequently 100 to 200 yards apart.

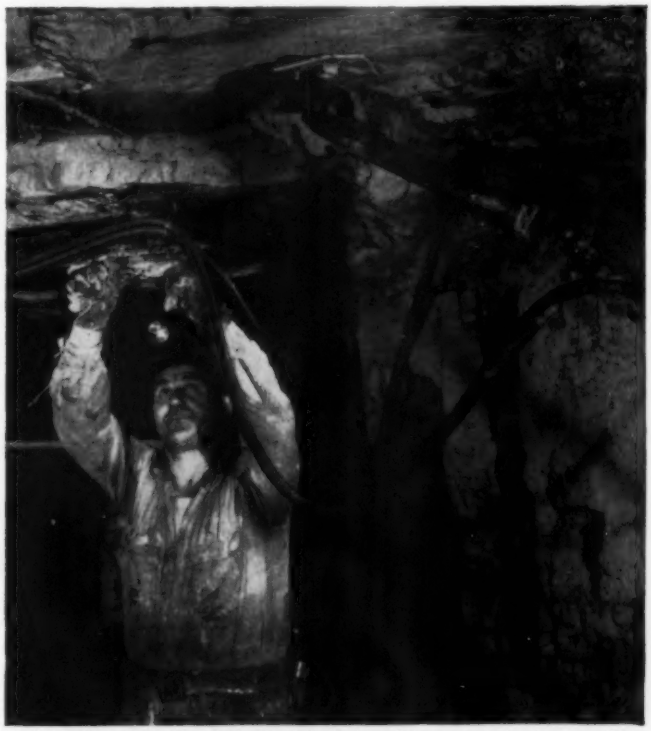
The shuttle car electrical cable takes a terrific beating. The car often takes a circuitous route, and the cable is pulled tight around the corners of standing coal while it is reeled and unreeled without stop for the entire shift.

The Tiger Brand cable has outlasted the previous cable by a considerable margin. This is partly due to our "Bridgewall" construction, which actually puts a sheath of live jacket rubber around each conductor. Even when the cable is kinked or smashed, the conductors are protected by a thick wall of the toughest jacketing compound available in the industry.

The other factor that contributes to long trouble-free life is the dynamically balanced rope lay conductors. Concentric stranded wires of the ideal size—as opposed to loosely bunched groups of fine wires—are carefully prestressed to give balanced performance and freedom from unequal elongation between conductors.

Tiger Brand cable isn't cheap, but it's a good investment for any company that needs long, hard service. See your American Steel & Wire salesman.

AMERICAN STEEL & WIRE DIVISION
United States Steel, General Offices: Cleveland, Ohio
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY NEW YORK



Workman ties up cable. Spring-loaded strain reliefs are used when possible. Tape on cable prevents it from slipping through the relief.

Shuttle car makes return trip. Cable feed center is out of picture 100 yards or so to the left, near the rail head.

USS TIGER BRAND ELECTRICAL WIRE & CABLE

a standard Tiger Brand cable for every special job

- Asbestos Wire and Cable
- Mold Cured Portable Cord
- Shovel & Dredge Cable
- Paper & Lead Cable
- Varnished Cambric Cable
- Interlocked Armor Cable
- Special Purpose Wire & Cable
- Aerial, Underground and Submarine Cable

USS

UNITED STATES STEEL

Geology of S.W. Indiana Described in Guidebook Prepared by State Survey

A recently issued publication of the Indiana Geological Survey, *Field Conference Guidebook No. 9,* was prepared for a field conference held on October 4-6 sponsored by the state geological survey and the department of geology of Indiana University.

The conference was scheduled to acquaint participants with the rocks associated with the Mississippian-Pennsylvanian unconformity in southwestern Indiana.

Included among the points visited by the conference group was the quarry of General Refractories, Inc., near Shoals; and the Mulzer Brothers quarry near Eckerty.

Copies of the *Guidebook* are for sale by the Geological Survey, Indiana Department of Conservation, Bloomington, Ind. Price, $1.

ROBERT O. VAUGHAN has been appointed administrative assistant to the general sales manager of Kaiser Gypsum Company, Oakland, Calif. He has been with Kaiser Gypsum since 1952.

S. B. Fleming Named Head Of Cement, Quarry Section Of Natl. Safety Council

Seymour B. Fleming, safety director of New York Trap Rock Corporation, West Nyack, N. Y., was elected general chairman of the Cement Quarry and Mineral Aggregates Section at the National Safety

S. B. Fleming

Council's annual meeting held recently in Chicago, Ill.

Mr. Fleming has been a member of the executive committee of the section which he now heads since 1947, serving for three years as editor of its newsletter and one year as program chairman. During the coming year he will preside at general sessions of the National Safety Congress in Chicago, as well as direct the work of the Cement, Quarry and Mineral Aggregates Section.

Medusa Portland Cement Company, Cleveland Heights, Ohio, reported that its net income for the 12 months ended September 30, 1957, totaled $3,368,700 or $4.05 a share, compared with $4,466,428 or $5.37 in 1956. Net income for the 1957 September quarter was $1,128,690 or $1.36 a share. In 1956 the September net was $1,409,401, equal to $1.79 a share.

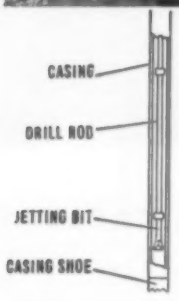
• Correction

We regret that a news item appearing on page 37 of the October issue of PIT AND QUARRY was incorrectly headed. The title of the story should have read as follows: New Unit Reduces Clinkering Time from Hours to Minutes.

What's down there?

Empire
TEST DRILLS
come up with the
RIGHT ANSWERS

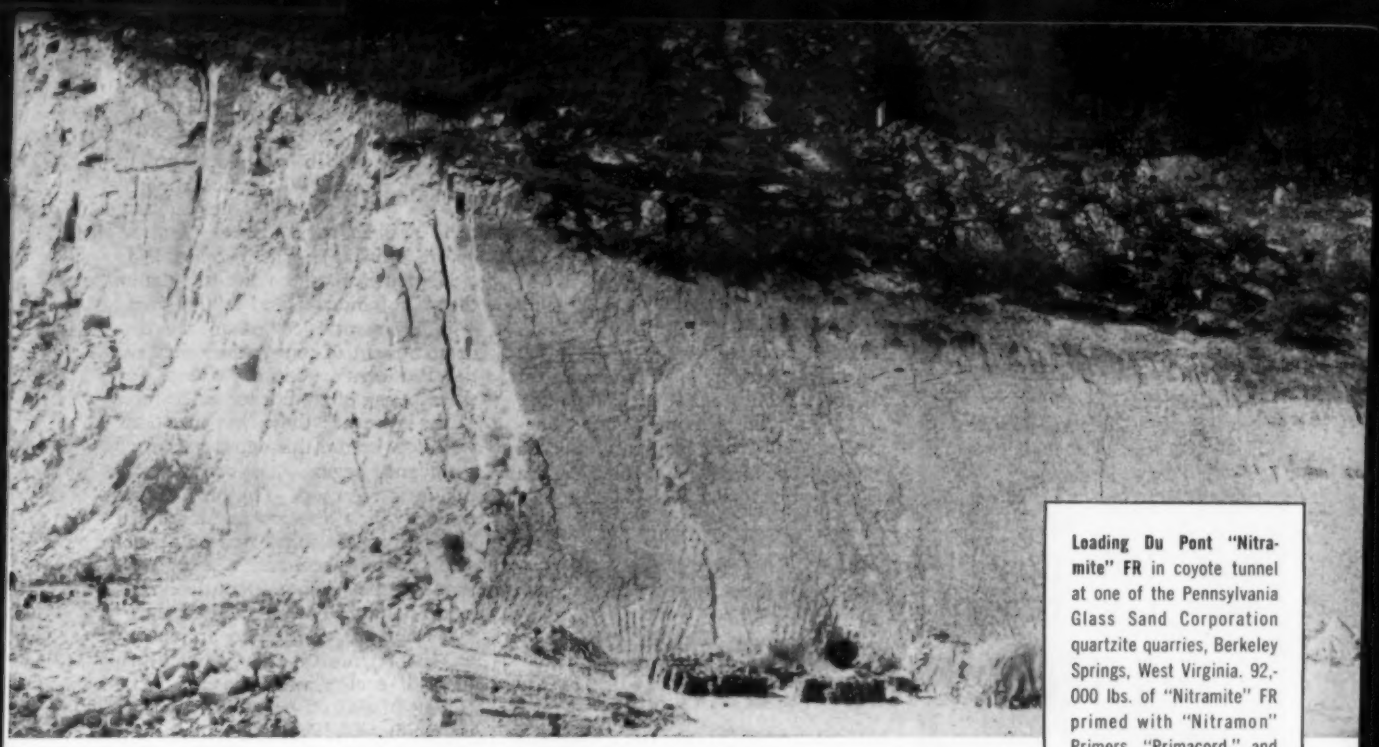
EMPIRE
Hydraulic
Testing
Drill



This test-drilling equipment is a "must" for pit and quarry operators and general contractors.
The EMPIRE Junior Drill used manually with solid rods or the EMPIRE Hydraulic Jetting Drill, using hollow rods, is the standard method of exploring sand and gravel deposits for composition and presence of clay, and accurately determines overburden depth and formation.
Easily transported in any kind of terrain. Assembled and ready for work in minimum time with ordinary labor.

Write TODAY for complete details

NEW YORK ENGINEERING CO. 75 WEST STREET NEW YORK 6, N. Y.



Loading Du Pont "Nitramite" FR in coyote tunnel at one of the Pennsylvania Glass Sand Corporation quartzite quarries, Berkeley Springs, West Virginia. 92,000 lbs. of "Nitramite" FR primed with "Nitramon" Primers, "Primacord," and EB Caps. "Nitramite" FR has all the safety features and the economy of other Du Pont blasting agents plus a much higher order of performance than other ammonium nitrate products.

450,000 tons of well-broken quartzite produced by Du Pont "Nitramite" FR which is ideal for coyote tunnels. Also suited for pouring in small diameter dry holes or as an economical top load in wet holes. For full details, see your Du Pont representative or write to E. I. du Pont de Nemours and Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

For maximum performance and safety use Du Pont "Nitramite" FR

DU PONT **DU PONT BLASTING AGENTS**

BETTER THINGS FOR BETTER LIVING... *THROUGH CHEMISTRY*

SEE DU PONT'S SHOW OF THE MONTH ON CBS

Basalt Rock Company Adds Tract to Holdings in Napa

Basalt Rock Company of Napa, Calif., expanded its facilities in southern Napa and Solano counties with the recent purchase of a 58-acre tract of land.

Basalt paid about $116,000 for the land, which includes three water-storage tanks and the quarry now being used by the firm.

Ideal Cement Co. Purchases Two Barges Costing $500,000

Two $250,000 steel barges are scheduled for delivery to the Ideal Cement Company of Denver, Colo., from Todd Shipyards in Seattle.

Each barge is 170 ft. long and 44 ft. wide, with a total depth of 12 ft. and a capacity to hold 7,500 bbl. of cement. They will be used to transport bulk cement in the San Francisco (Calif.) Bay area.

Net income of $1,493,445, equal to $2.52 a share on sales of $13,234,399 was reported by North American Cement Corporation, New York, N. Y., for the 9 months ended September 30, 1957. Comparable 1956 figures are $1,468,400 or $2.55 a share on net sales of $13,640,150.

More GIANT Sizes! More GIANT Tread Designs! More GIANT Savings! . . . Now at

SOUTHERN TIRE COMPANY

Probably more dirt and rock is hauled on Southern Tire retreads than on any other retreaded tires. That's because more and more contractors and heavy equipment operators are discovering the superior quality and economy of Southern Tire retreads.

Southern Tire offers not only the country's most complete range of tire sizes and tread designs, but also the world's finest retreading facilities — three-sectional molds that mean no buffing to breaker strips regardless of growth.

These facilities and use of finest tread rubber, plus Southern Tire's long experience, assure better quality with greater economy. Call your tire dealer now for facts about how Southern Tire retreads can save you as much as 40% of the price of new tires yet give you guaranteed new tire service.

All sizes — from 1100 x 24 to 33.5 x 33

SOUTHERN TIRE COMPANY

1414 Broadway
SHEFFIELD, ALA.

Phone Collect
EV 3-2312

Washington News Letter

(*From page* 12)

Mayor Wagner in New York City or even the record of Governor Meyner in New Jersey. It would appear that the Republicans lost these elections before Russia launched Sputnik I.

Nevertheless, there is little doubt that our falling behind in the scientific-armament race led to the disenchantment of many who relied on the President's military wisdom for their feeling of confidence and safety.

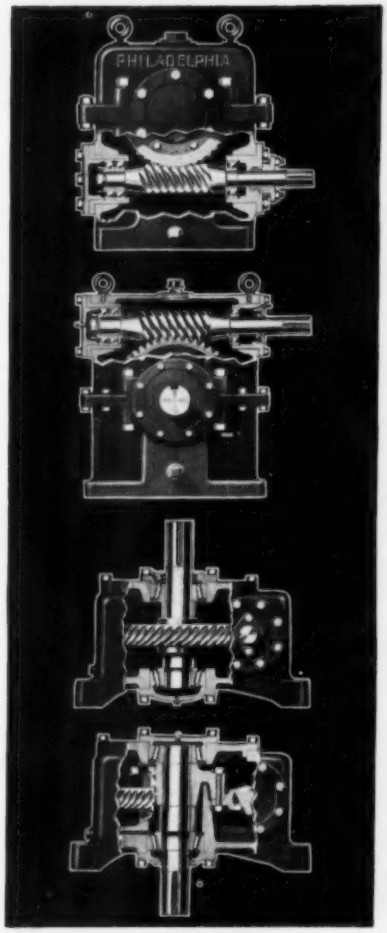
If, however, these key elections were lost before this deterioration of confidence began, some other explanation is required. The only explanation which appears to fit the bill is found in the third area of discussion, namely, economics. For some months the economic outlook has been cloudy. The predictions, however, had all pointed to an upturn this fall. Unfortunately, this upturn did not occur; and here again the timing of the off-year elections was unfortunate. They came at just about the time that the full realization hit us that the upturn had not come and was unlikely to come. As things now stand, the general predictions are that the forthcoming Christmas season will not set any new record. Retailers, generally, are more than prepared for a repetition of '56 sales, which just topped '55.

This is not to say that 1957 will turn out to be a bad year, but rather that in 1957 the seeds of a recession may have been sown. One of the brightest signs in this connection, is the fact that in recent statements, the President and the Secretary of Labor, as well as some less highly placed officials, have forthrightly stated that the business outlook is less favorable than they had hoped it would be. Recognition of the problem is, of course, the first step towards its solution. Nevertheless, the debate which has been raging in Washington now for several months as to whether the time is right for a reversal of the Administration's deflationary policy continues unabated. No resolution of the problem appears imminent. The Federal Reserve Board has been sticking to its guns and has, even recently, sold securities, a move designed to further tighten credit availability.

An immediate solution would be realized if the government purse strings were loosened quickly so as to advance the missile program rapidly. This action, in turn, would help the politicians in their problem. For this reason, perhaps more than for any other, such a relaxation is being freely predicted.

Quality is *inherent*, Service and Long Life *proven*...

Philadelphia WORM GEAR REDUCERS



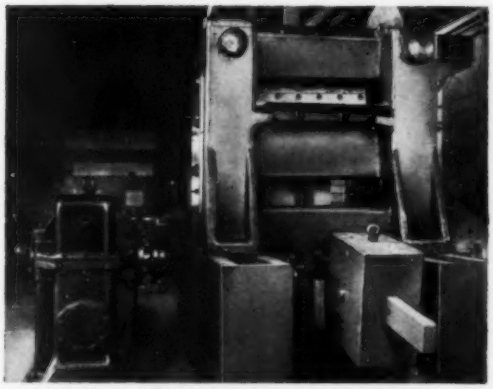
Whether you desire just worm and worm gear sets, or complete self-contained Worm Gear Speed Reducers — Phillie Gear is capable of meeting your most exacting requirements.

Philadelphia Worm Reducers are available in single or double reductions in horizontal right angle drive types, with the output shaft above or below the worm shaft — and in single or double vertical types, with output shaft extending up or down. Standard reductions in the single type are up to 90 to 1, and the double reduction types from 102 to 1, to 6300 to 1.

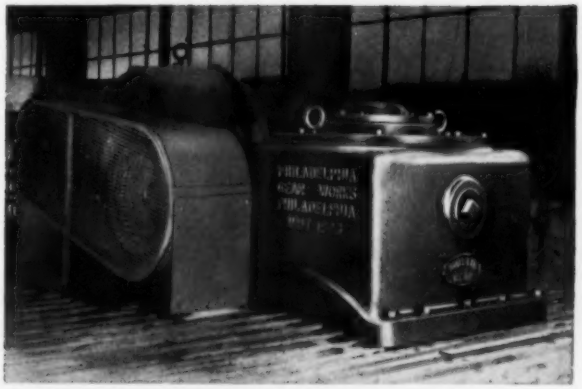
All sizes and types of Philadelphia Worm Reducers provide efficient, smooth and dependable power transmission under the most rigorous and severe operating service — Thousands are in daily use in industry throughout the World.

For detailed information, write for Catalog WG-562, and please use your Business Letterhead when requesting your copy.

a type and size for any requirement



Type AT Philadelphia Worm Reducer driving 44" Up-cut Hot Shear.



Double Reduction type DVT Philadelphia Worm Gear Reducer on special down-shaft application.

phillie gear®

PHILADELPHIA GEAR WORKS, INC.
ERIE AVE. & G STREET, PHILADELPHIA 34, PENNA.
Offices in all Principal Cities

INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS

Limitorque Corporation • Philadelphia

IT'S CHRISTMAS
KENNEDY-VAN SAUN

At this season of the year
we pause to thank our
many loyal friends whose
confidence in our equipment
has made our continual
growth possible.

around the world...

J. E. Kennedy

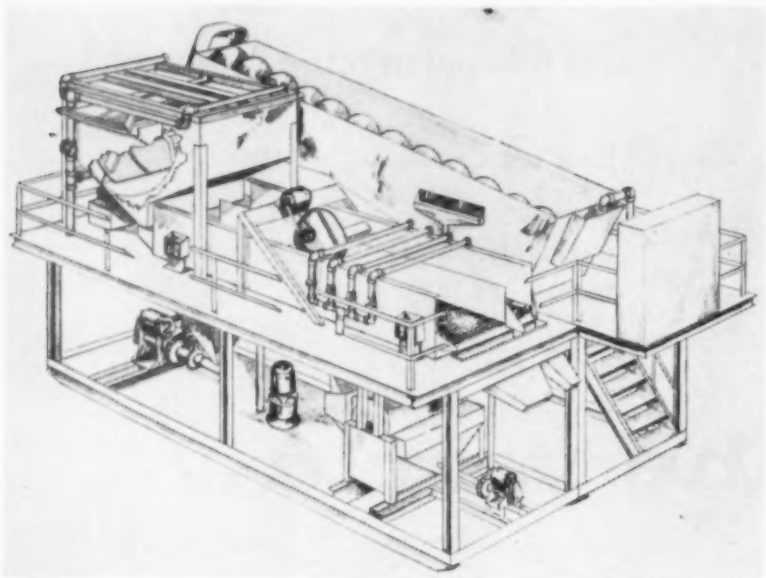
CHAIRMAN OF THE BOARD

MANUFACTURING
& ENGINEERING
CORPORATION

TWO PARK AVENUE, NEW YORK 16, N. Y.
FACTORY, DANVILLE, PA.

New Machinery
and Equipment

For Further Information Use Card on Pages 139-140



● A new, compact heavy media separation plant, available in capacities from 25 t.p.h. and up, has been introduced by Eagle Iron Works. The new Eagle HMS plant features the Ore & Chemical Corp. OCC Separatory Vessel which has been made available to the sand, gravel, and crushed stone industry exclusively through Eagle Iron Works. Large productive pool area of the OCC Vessel, plus constant hydraulically actuated raking mechanism, provide maximum separation of deleterious matter and high output of recovered aggregate.

Other features of the plant include an improved screw densifier of Eagle design, a highly efficient magnetic separator, ground level sump which eliminates need for below-ground concrete pit or sump, and a conveniently located control panel on the upper deck.

The HMS plant is pre-assembled at the factory into four easily connected units which can be quickly assembled at the installation site and can be readily transported from deposit to deposit. **(51)**

● Model B-4 Hydra-X-Cavator-Crane, manufactured by Davis Engineering, Inc., features a completely hydraulic crane with a 360 degree swing, continuous rotation left or right, and road speeds up to 40 m.p.h. These features combine to give this new hydraulic excavator crane ruggedness, handling ease, speed, and utility.

With a turning radius of 17½ ft., the Hydra-X-Cavator can be maneuvered in close quarters. With the ⅜ cu. yd. backhoe attachment, the unit has a digging depth of 11½ ft., and can load trucks at the side or from over the front.

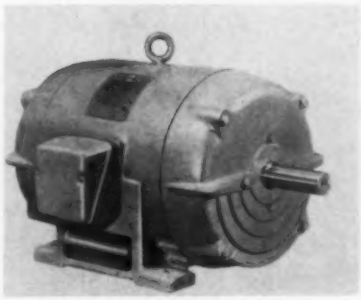
Among the many other attachments available are shovel, crane, and clamshell.

The B-4 conforms with all state highway regulations for length, height, and weight. It is powered by a Continental F-226 6-cylinder engine, and equipped with heavy-duty, 4-speed truck transmission and clutch, Timken drop forged I-beam section spring mounted front axle, and hypoid gear rear axle. **(52)**

● The Louis Allis Company recently began production of a synchronous induction motor built in the same N.E.M.A. frame size as a standard motor of equal horsepower.

Called the Syncro-Spede, this motor accelerates as an induction motor but runs at exact synchronous speed without permanent magnets or d.c. excitation involving collector rings and brushes, wound rotating fields, etc. It is suitable for use on many applications requiring constant speed with varying load.

As a conveyor drive, the motor makes it possible to have an exact constant-speed or adjustable-speed system from no-load to full-load conditions with a minimum of driving units and controls. Since this motor is unaffected by voltage fluctuations, it is also recommended for precision



timing and metering devices and for recording instruments.

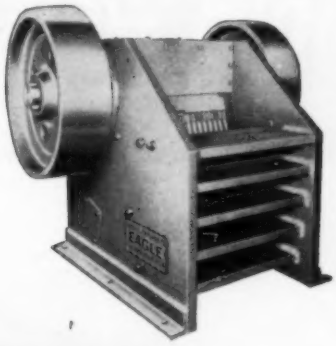
The Syncro-Spede is manufactured in ratings from 1 to 100 hp. in any enclosure type. **(53)**

PRODUCE MORE STONE AND GRAVEL WITH MOBILE

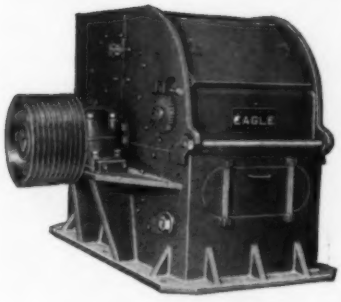
Eagle Crushers

Portable Eagle crushing plant operated by Harry Miller Contracting Co., Suffield, Ohio, delivers pit run sand and gravel at rate of 100-125 yds. per hour for cushioning concrete super-highway nearby. Whole layout can be moved as gravel is consumed. (Power source is electric generator set—could be gasoline or diesel direct drive.)

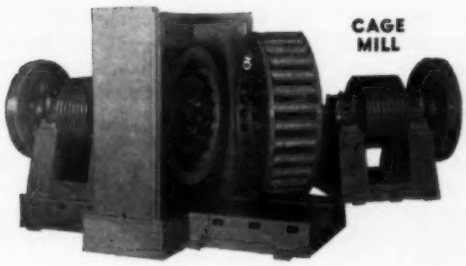
JAW CRUSHERS



HAMMER-MILLS



CAGE MILL



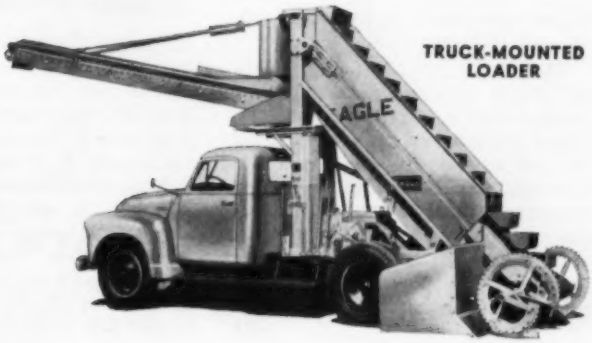
Eagle Crushers—both jaw type and hammermill—bear the characteristic marks of the experienced manufacturer—simple design, durable construction, ease of servicing. Eagle originated the one-piece, electrically welded frame—has pioneered in the field of portable, compact, crusher plants like the one above.

There is a range of sizes in the jaw crusher—and a variety of styles (skid-mounted, trailer, portable, roadside). Likewise, the hammermill or impact breaker is made in several sizes and for various applications—is particularly well suited to limestone reduction.

EAGLE
JAW CRUSHERS · IMPACT BREAKERS
PULVERIZERS · CONVEYORS · LOADERS
CRUSHER CO., Inc. GALION OHIO·U·S·A

You are invited to consult our engineers on your crusher problem—no obligation!

TRUCK-MOUNTED LOADER



● Kenworth's 803-B rear dump has a rated payload capacity of 64 tons or 40 cu. yd. struck. It is powered by a single 12-cylinder diesel engine, with a choice of either 400 or 600 hp.

The dump body is of all-welded steel construction, having strong bracing through box-section ribs and longitudinal reinforcement between the ribs at the body sides. Dumping action moves the tractor back and under the trailer as it rises. **(54)**

● Joy Manufacturing Company announces its new Model 125 rotary blast hole drilling rig. The Model 125 is equipped with Duo-Flow, an efficient feed mechanism consisting of a combination mechanical and high-torque reversible hydraulic motor and air compressor.

The Model 125 also features double drum type drawworks mounted on a common shaft, hydraulically raised and lowered mast for fast rig up and tear down, and Proximity Controls which give the operator complete control of the rig without moving from the operator's position.

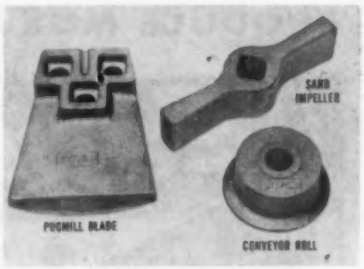
The rig is either truck or trailer mounted with power provided by truck-engine or auxiliary power unit. **(55)**

● Kennametal Inc. has introduced a new material for hardsurfacing called Kenplate. This new material consists of small hexagonal plates of cemented tungsten carbide mounted on an adhesive backing ready for bonding to metallic surfaces.

The flexible adhesive backing permits joining or cutting the standard sheets to form any desired shape for mounting on flat curved surfaces; it holds the plates in position while they are bonded by epoxy adhesives, silver solder, or conventional brazing materials to provide continuous sur-

faces that utilize the exceptional wear-resistant properties of hard tungsten carbide.

Two sizes of hexagons, each in three thicknesses, are now being made. They are 0.425 and 0.210 in. across the flats. Thicknesses are .040, 1/16, and 1/8 in. for 0.210 in. plates, and 1/16, 1/8, and 1/4 in. for 0.425 in. plates. **(56)**



● The Calumet Steel Castings Corporation has developed a chrome ferrous alloy called ZeVesCal for use in casting heavy-wear parts such as those shown in the above illustration.

ZeVesCal is described as a composition of extremely hard, complex carbides, embedded in a matrix of unstable austenite.

Under work loads, this alloy reportedly acquires an increase in hardness. **(72)**

● Extremultus, Inc., is offering a new type of power transmission belt made from a combination of two materials—a special type of polymer, which is the tensile member, and a chrome tanned leather, which is the friction surface.

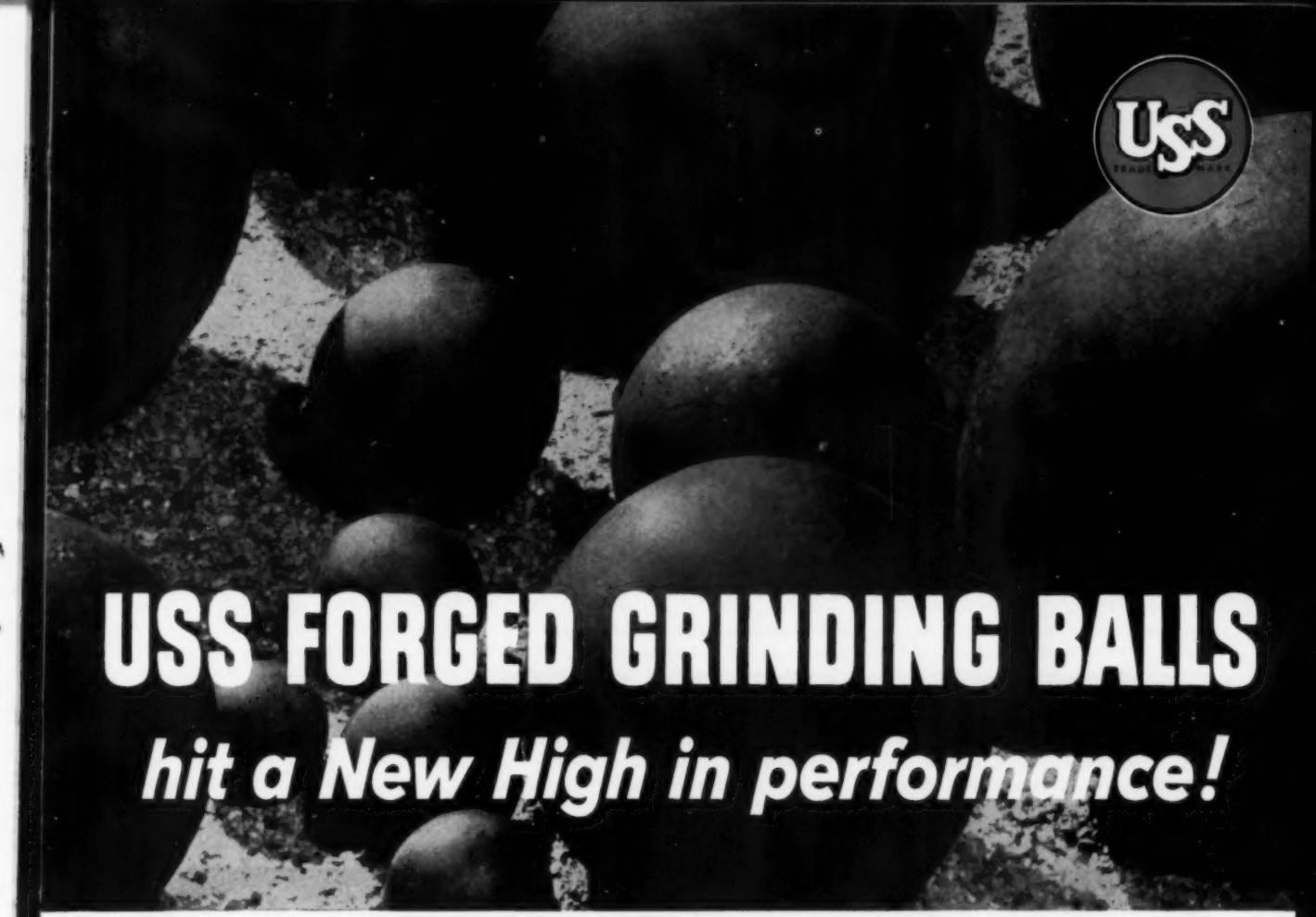
According to the manufacturer, Extremultus belt will not slip or stretch; it will operate at speeds up to 24,000 f.p.m. and horsepowers up to 6,000. **(57)**

● Two new low-cost portable aggregate screening plants, designed for a high rate of production, have been announced by Pioneer Engineering.

Designated Models No. 366 and No. 488, the new plants consist of a single-deck buzzer screen and reciprocating plate feeder permanently mounted on a lattice frame conveyor installed on a hydraulic cradle truck. Model 366 is equipped with a 3 ft. by 6 ft. screen; the Model 488, with a 4 ft. by 8 ft. screen. Feeder and conveyor are matching.

On both models the screen is pivot mounted on the delivery end of the conveyor, allowing it to be easily swung to operating position or to be folded under the conveyor for transport. Hydraulic raising and lowering of the conveyor further simplifies setup and operation. **(58)**

adjacent three quadrants and flows



USS FORGED GRINDING BALLS

hit a New High in performance!

New manufacturing facilities at U. S. Steel have now made possible forged steel grinding balls with three outstanding characteristics:

HARDNESS

The hardness patterns obtained in USS Grinding Balls assure superior grinding qualities and long service life in all types of grinds.

TOUGHNESS

To resist breakage, each size and type of USS Grinding Ball has the maximum toughness compatible with its depth of hardness.

UNIFORMITY

The exacting controls that are necessary in processing, particularly heat treatment, combined with frequent laboratory checks, insure consistency in quality—ball to ball and load to load.

There are two types of USS Forged Steel Grinding Balls available: USS Carbon-Manganese, for most mill operations, and USS Alloy Steel, for unusually severe grinding conditions. Both types are manufactured in the same sizes: ¾", ⅞", 1", 1¼", 1½", 2", 2½", 3", 3½", 4", 5". To find out what makes the "good" grinding ball *you* need, send for our new free booklet, today. Just fill out and mail the coupon.

United States Steel Corporation
525 William Penn Place, Room 5078
Pittsburgh 30, Pennsylvania

Please send me a copy of "USS Forged Grinding Balls."

Name .....

Company .....

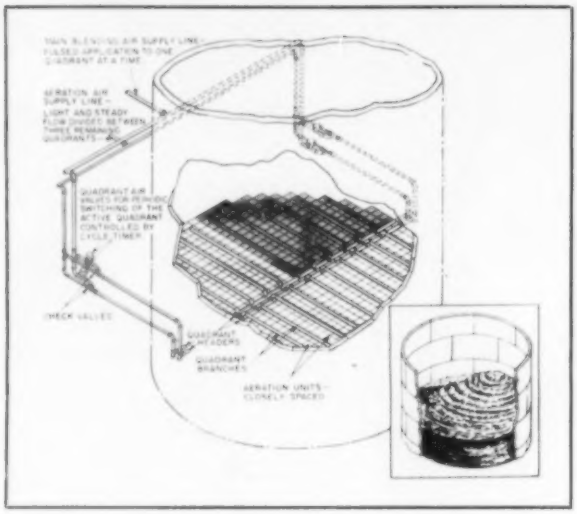
Address .....

City ..... State .....

USS FORGED GRINDING BALLS

United States Steel Corporation, Pittsburgh • Columbia-Geneva Steel Division, San Francisco
Tennessee Coal & Iron Division, Fairfield, Ala. • United States Steel Export Company, New York

UNITED STATES STEEL



The cutaway drawing of the silo shows placement of aeration units, quadrant headers and branches, and air supply lines and control valves. Small inset indicates activity of material in silo during the blending process.

● Fuller Company's new Airmerge quadrant blending system for dry bulk pulverized materials is said to reduce deviations in unblended components down to ±.2 percent. Basically an aeration system, Airmerge is described as being capable of blending materials with different bulk densities and finenesses at high tonnage capacity.

The quadrant blending method makes use of a round silo with a substantially flat bottom covered with Fuller aeration units. Compressed air is applied in pulsations to one quarter section of the silo bottom at a time, in a volume sufficient to fluidize the dry pulverized material above that individual section.

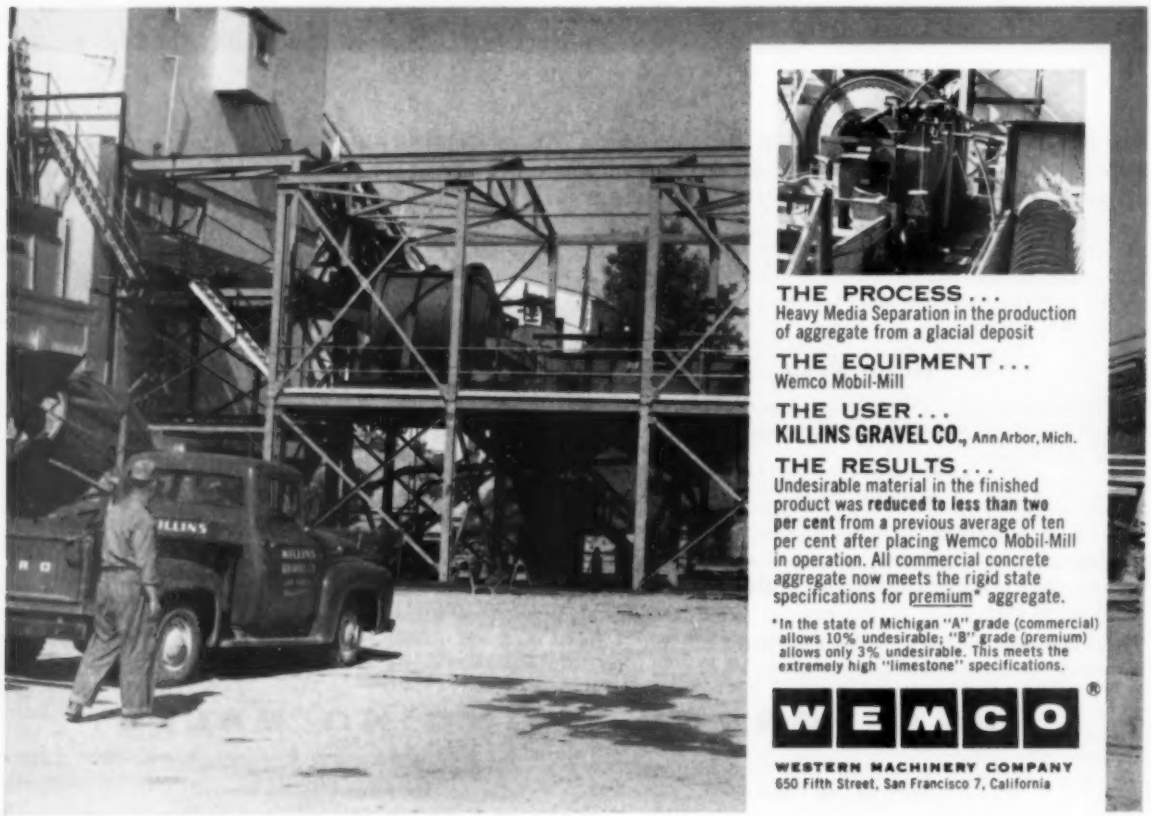
As a result of being expanded and at the same time becoming fluid, the material rises above the level of the adjacent three quadrants and flows out across them.

The rising column of expanded material in the actively aerated quadrant is thus partly surrounded with heavier material which tends to slump over into the active quadrant, where it becomes aerated, expands, rises, and flows outward. A strong and continuous roll-over motion in a vertical circuit is obtained which results in a thorough mixing.

Aeration is periodically switched from quadrant to quadrant in rotation, and after one circuit of the silo bottom all of the material has been put into motion. Two such circuits will generally result in completely blended material.

The Airmerge system can be used in either batch or continuous schemes of operation. One silo may be used to accumulate and blend a batch which is subsequently fed out to the process. For serving a continuous process, two or more silos are used so that one can be feeding the process while a batch is being accumulated and blended in the other.

Another scheme is to fill a silo and withdraw from it continuously, maintaining the material level with a steady inflow of unblended material at the same rate at which the blended mix is being withdrawn. (59)


THE PROCESS . . .
Heavy Media Separation in the production of aggregate from a glacial deposit
THE EQUIPMENT . . .
Wemco Mobil-Mill
THE USER . . .
KILLINS GRAVEL CO., Ann Arbor, Mich.
THE RESULTS . . .
Undesirable material in the finished product was reduced to less than two per cent from a previous average of ten per cent after placing Wemco Mobil-Mill in operation. All commercial concrete aggregate now meets the rigid state specifications for premium* aggregate.
*In the state of Michigan "A" grade (commercial) allows 10% undesirable; "B" grade (premium) allows only 3% undesirable. This meets the extremely high "limestone" specifications.
WEMCO
WESTERN MACHINERY COMPANY
650 Fifth Street, San Francisco 7, California

● A new type of multiwall paper bag for industrial chemicals and other dry products has been developed by the Multiwall Bag Division of the Owens-Illinois Glass Company, in cooperation with the Wyandotte Chemicals Corporation.

The main feature of the new bag is a pasted valve reducing insert which permits standardization of pallet patterns regardless of the density of the packaged product. The bag readily lends itself to high-stacking, thus making more economical use of space in boxcars, trucks, and warehouses.

The valve reducing insert now makes it possible for Owens-Illinois to make a bag of standard length and width, but with a thickness when filled that may range anywhere from 3½ in. up to 6½ in. The capacity of the bag, in other words, is varied to suit the properties of whatever material is put in it, without altering the two dimensions which govern pallet patterns.

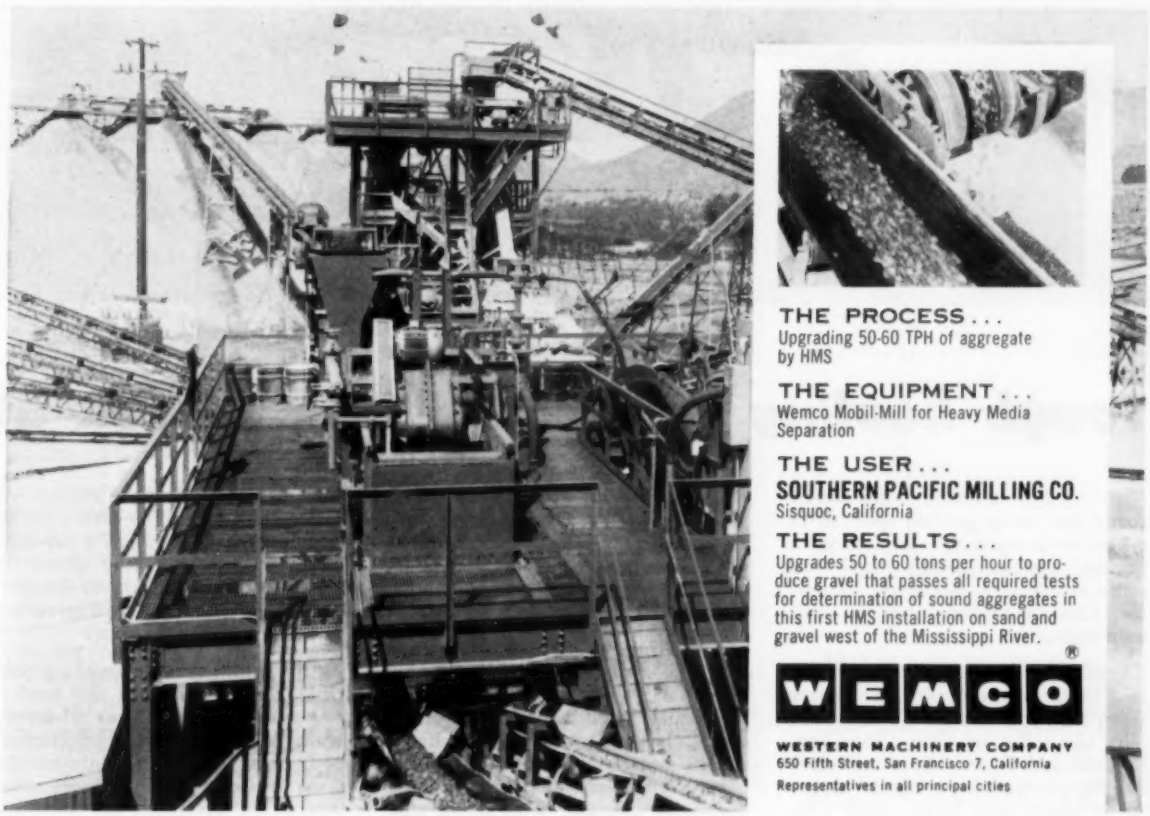
Such a bag has been sought for years, but mechanical limitations restricted thickness of the filled bag to the actual width of the filling valve.

The problem was to find a way to change the thickness of the filled bag without changing the valve size. Experiments demonstrated that the idea of the new valve was sound. O-I went into volume production at its Multiwall Bag Division plant.

An Owens-Illinois Multiwall Bag Division customer may specify whatever size valve reducing insert he may need to fit his packing machinery filling spouts.

The insert is designed and applied to the bag so that a tight, self-sealing factor is added, insuring against costly spillage. The new bag is a three-ply, using two 40 basis weight sheets and one 50 basis weight sheet of natural Kraft paper. (60)

Wyandotte's new pallet pattern, a 3-2 arrangement using the new bag.



THE PROCESS . . .
Upgrading 50-60 TPH of aggregate by HMS

THE EQUIPMENT . . .
Wemco Mobil-Mill for Heavy Media Separation

THE USER . . .
SOUTHERN PACIFIC MILLING CO.
Sisquoc, California

THE RESULTS . . .
Upgrades 50 to 60 tons per hour to produce gravel that passes all required tests for determination of sound aggregates in this first HMS installation on sand and gravel west of the Mississippi River.

WEMCO®

WESTERN MACHINERY COMPANY
650 Fifth Street, San Francisco 7, California
Representatives in all principal cities

Tough hauling problem? Take a look at

If heavy loads, rough roads and steep grades, *with little or no turn-space,* are part of your hauling problems, then you'll find some answers in Koehring Dumptor. Come along on a typical load-haul-and-dump cycle:

There's no slow jockeying back and forth at the loader. Dumptor spots into position fast — is loaded over the sides, or over either end. Wide-flared 6-yard body, with low height, provides a big square target — *64 square feet, to be exact.* This reduces spillage, steps up output of shovel, dragline, clamshell, or tractor type loader — adds extra trips to daily production.

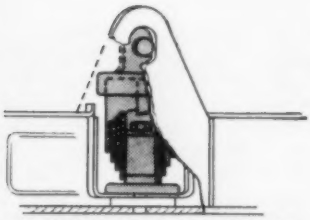
On the haul, Dumptor accelerates fast, pulls through soft ground with less shifting — climbs 24% ramps or grades fully loaded. It has better than 6 H.P. of *"go"* for every ton of loaded weight. Narrow haul roads, ledges, tunnels, overhead ramps and trestles are no problem, *There is no need to turn,* because Dumptor operates with equal ease and speed in either direction. It gets this unique *no-turn shuttle-haul* advantage through a constant-mesh transmission that gives the same, fast, 3-speed travel forward and backward. Every turn saved cuts 15 seconds off cycle-time.

At the dump area (above), *gravity* tilts the body, dumps the load in *one second.* No 15 to 25-second wait for slow-acting mechanical body-hoist — no hoist maintenance. *Gravity-dump* never balks — never wears out. Heavy-duty Dumptor

Dumptor® . . . .

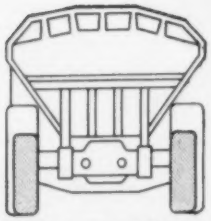
also has a ton of strength for every ton of payload capacity. Sides, ends of body are rib-reinforced. Double-plate bottom is lined with multiple steel beams. Check its other advantages at right — then ask Koehring distributor to demonstrate what Dumptor can do on your heavy, off-road hauling. Call him *today.*

KOEHRING
DIVISION OF KOEHRING COMPANY
MILWAUKEE 16, WISCONSIN 5766



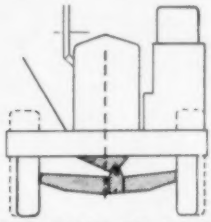
HEAVY-DUTY CHASSIS SPRING

Dumptor has just one chassis spring — a heavy snubber-type, mounted between main frame and steering axle. No leaf springs. Big shock-absorbing drive tires eliminate springs and spring maintenance on drive axle.



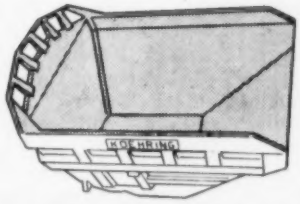
TIRES TRACK IN DIRECT LINE

Wide, heavy steering axle puts Dumptor steer wheels in line with drive wheels. Tires track in the same path. There's less rolling resistance, better traction in soft ground, on loose stockpiles and over rough haul roads.



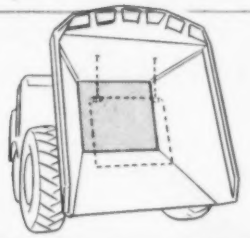
OFF-SET PIVOT ON AXLE

Pivot point on steering axle is offset from center line 3¼" toward operator side of Dumptor. There's no sag, even with unbalanced loads. Steering axle oscillates up to 21", helps keep twisting strains out of main frame.



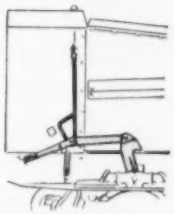
STREAMLINED ALL-STEEL BODY

There are no bulges or ledges inside the body. Top edge is box beam construction. Sides and ends are ribbed with 5 and 8-inch channels. Bottom is lined with multiple steel beams. Sturdy ridge bar joins rock guard teeth.



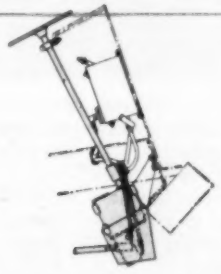
BOLTED OR FREE-SWINGING PAN

Heavy steel kick-out pan is ½" thick. Pan can be bolted to body floor for extra protection when loading rock. Remove bolts, and pan has swinging kick-out action . . . breaks load suction when dumping wet or sticky materials.



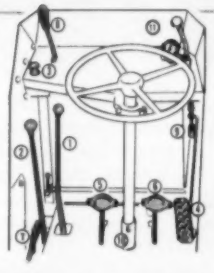
SIMPLE BODY LATCH

Body latch for 1-second gravity dump is simple and trouble-free. Latch is engaged by a single hook mounted on the chassis frame. Dump lever is located inside cab in an easy-to-reach position for quick effortless dumping.



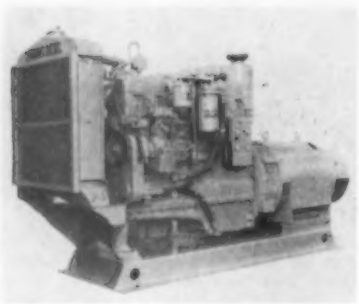
HYDRAULIC POWER-STEER

Power steering adds to Dumptor maneuverability for fast spotting, lets driver handle off-road travel with ease. Dumptor has a short turning radius of only 19'-3", far less than other haulers of comparable capacity.



EASY-REACH CONTROLS:

(1) speed gear shift, (2) directional gear shift, (3) starting aid, (4) foot throttle, (5) clutch pedal, (6) brake pedal, (7) parking brake, (8) body release lever, (9) hand throttle, (10) light control switch, (11) Controlator.

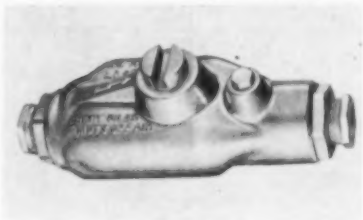


● This Cummins diesel-driven fully-automatic electric power plant has a 50 kw. capacity, 60-cycle, three-phase, four-wire, 120/208-139/240-v. rating, and is capable of carrying the full load continuously and a 10 percent overload for two hours. The generator set is powered by a Model H-6 Cummins diesel which is rated 93 hp. at 1,200 r.p.m. for continuous duty operation.

The set includes a switchboard on which meters, control equipment, and automatic transfer switch are mounted. It is equipped with a hydraulic type isochronous governor capable of regulating the frequency output of the alternator within ±½ of 1 percent of rated frequency (60 cycles) under all conditions of load.

The set will be arranged to start automatically within seconds on a reduction in commercial power service voltage to 85 percent or less of normal on any phase. The alternator is of 50 kw. capacity, 1,200 r.p.m., three-phase, four-wire, 60-cycle with direct connection. **(61)**

● A new automatic line oiler which protects air tools and saves oil consumption is being manufactured by the Le Roi Division, Westinghouse

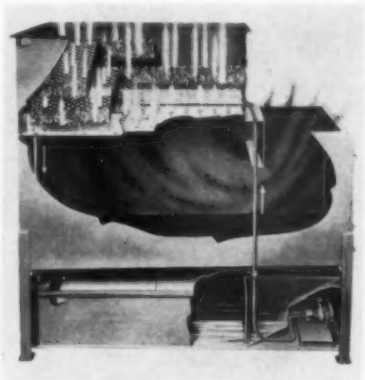


Air Brake Company. The positive type oil-pickup feeds oil the instant drilling starts; when the oil supply is exhausted, the air supply to the air tool is automatically shut off.

Differential pressures are used to operate the automatic line oiler. Air is routed through the oiler to create a pressure on the inside of an oil resistant bellows; this forces a regulated amount of oil through a porting, injecting oil into the air stream at the outlet end of the oiler. When the oil chamber is empty, the bellows activates the shut-off plunger, cutting off the air supply to the air tool.

Lightweight, and measuring less than a foot in length, the oiler is easy to incorporate into air lines or to mount onto compressors. Its top capacity is 300 c.f.m. **(63)**

● A redesigned Cycoil oil bath after-cleaner, the P-17, has been introduced by the American Air Filter Company, Inc. The P-17 is an automatic, self-cleaning dust collector that separates dust from the air as it passes through a viscous crimped-wire, fluid bed pad. The dust-laden



air is mixed with the oil by means of a perforated plate over which the oil flows from a central distributing point.

The upward flow provides the holding force required to keep a large quantity of oil in the fluid bed pad. The fluid bed pad is so designed that the collected oil droplets drain to the perimeter which is out of the air stream. This washing action keeps the pad clean and the dirty oil flows back to the settling tank where dust particles settle out as a sludge and the oil is recycled to the Cycoil.

A separate oil reservoir and sludge settling tank permits easier sludge removal. The collected dust can be removed periodically while the Cycoil is in operation. The settling tank can also be disconnected during the period when the system is not in operation and taken to a disposal point. **(64)**

● Bucyrus-Erie's new 11-B transit crane-excavator is readily convertible from a 10-ton lifting crane to a dragline, clamshell, shovel, or hoe. The 11-B is mounted on a six-wheel drive carrier which provides speeds up to 47 m.p.h.

Several new features incorporated in the design of the 11-B provide ease of maintenance. The hoist shafts, horizontal transmission shaft, horizontal swing shaft, and swing circle are unit or bench assemblies, designed for quick service or easy replacement.

Two-section cab design includes sliding doors and hinged, removable cab panels for easy accessibility to main machinery. Ball bearing swing circle and the use of antifriction bearings to mount all moving parts on revolving frame assure long wearability.

Nylon pins and bushings in operating lever system eliminate the need for lubrication. In addition, all gears and pinions in main machinery (except the swing pinion and rack) are enclosed and run in oil. **(62)**

FULL MEASURE—FROM CUT TO FILL!

Big Diesel Power . . . Allis-Chalmers 844-cu in. engine delivers more power per pound of gross vehicle weight . . . more torque when loading . . . more *drive* when hauling and spreading.

Correct Weight Distribution. When empty, 66 percent of weight is carried on tractor wheels for greater driving ability. When loaded, the total weight is equally distributed on each of the four wheels for maximum flotation, traction and tire life.

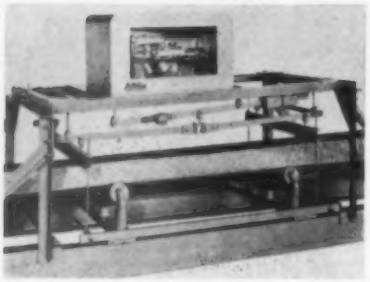
Exceptional Maneuverability with fast, positive 90° steering. Positions quickly in the cut, moves fast off the fill. Two-stage hydraulic steering maintains accurate control on the haul road.

The TS-260 also offers true "boiling action" loading . . . positive forward forced ejection for quick, clean spreading . . . heavy-duty power train . . . and many other advantages you'll have to *see* to fully evaluate. Ask your nearby Allis-Chalmers dealer for a working demonstration soon, on *your* job, and see why the profit-producing TS-260's are making new friends every day. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

Engineering in Action

Special auxiliary wheels . . . to meet highway weight limits. Twin front wheels are attached quickly and easily to distribute weight . . . let you move the TS-260 between jobs on its own power.



● A redesigned line of belt conveyor scales for weighing, controlling, and totalizing free-flowing bulk materials is available from ABC's Scale Division, McDowell Company, Inc. Built to an accuracy of ½ to 1 percent of flow over their entire weight range, units are available in any capacity for any belt width.

The scale housing is fabricated from dust-sealed aluminim, with Neoprene sponge seals, compared with the former housing, which was of steel with felt seals. A full-opening door with three-quarter size window improves visibility and permits easy access for setting, routine checking, and maintenance. The belt scales utilize mechanical linkages in both weight measuring and registering systems to minimize and simplify maintenance.

The balance and totalizing system has been re-engineered for long-life with trouble-free accuracy. The gear box drive incorporates sealed-for-life bearings. Self-cleaning V-rail construction is used for the integrator mechanism. Other wear parts have been re-engineered in machined high-alloy aluminum, and the base of the scale has been changed to rigid, jig-welded steel. (65)

ROUND-HOLE DRILLING

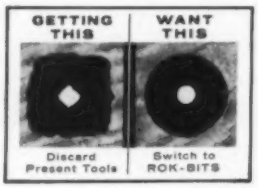
...with Brunner & Lay Rok-Bits keep 200 tph dolomitic agstone plant on schedule

Brunner & Lay carbide Rok-Bits in these body types—cross, chisel, "X", cutaway, taper socket. Furnished in standard wagon drill and hand held drill threads, also—600, 400, 200 and J-7.50 threads. Bit sizes up to 6½-in in our Hole-Master.

A 30-ft quarry face is worked in this steeply dipping limestone formation. Drills using 3-in Brunner & Lay Rok-Bits average 2 ft. every 3-minutes. Drilling pattern provides 40 to 50 holes in 4 rows drilled on 14-ft space and 10-ft burden.

Blast hole drilling jobs go fast—costs stay low—when you drill ROUND holes. Non-rifled Rok-Bit holes. Rods pull easily. Loading is faster. This is the experience of Campbell Limestone Co., Blacksburg, S.C., and of hundreds of other Rok-Bit users who chose bits through competitive tests.

Brunner & Lay Rok-Bits give increased drilling speed, greater footage life, fewer bit changes and lowest cost per foot of hole drilled. Put their cost cutting features to work for you. Write for NEW catalog #756. Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill. Plants & warehouses: Philadelphia, Asheville, Birmingham, Dallas, Denver, Los Angeles, Portland, Ore., Montreal.

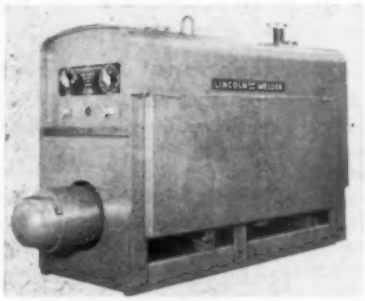


Brunner & Lay Products

CARBIDE ROK-BITS • INTRA-SET STEEL • DRILL RODS • COUPLINGS, ADAPTERS & EXTENSION STEEL

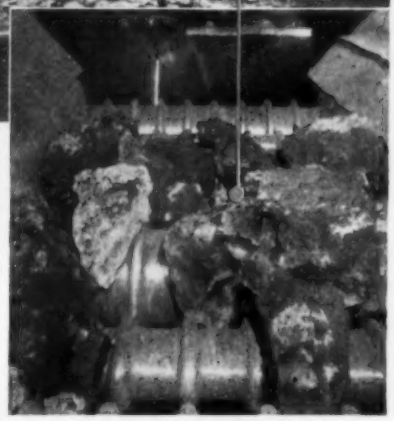
● Designed specifically for mining operations, International Harvester's new 55-hp. TD-6 crawler tractor features a low, 5-ft. profile and a new Drott short-coupled, stainless steel exhaust scrubber which cools exhaust gases to a maximum of 160 deg.

Incorporated in the new model is the Drott Four-in-One 1-cu. yd. front-end combination of dozer, clamshell, carry-type scraper, and Skid-Shovel. (66)



● The Lincoln Electric Company announces a new model of its 6090, 200 amp. gasoline engine-drive portable arc welder. Called the K-6090, the welder is N.E.M.A. rated 200 amp. at 40 v. and 60 percent duty cycle. It has dual controls for the generator output, an electrical outlet providing 1 kw. of auxiliary d.c. power, an idling device, and is powered by a 36-hp. water-cooled engine. (67)

Wobbler in quonset-type structure feeds oversize to spoils pile. Fines go to screens and conveyors.



The UNIVERSAL WOBBLER has

cut our grizzly maintenance from 2 days a week to 4 hours a month

Says Jack Harrington, Plant Engineer, Thomas Connelly Co., Hammond, Indiana

"We handle daily about 6400 tons of open-hearth and blast-furnace slag—reclaiming the iron and processing the rest with screens and crushers.

"Up 'till November, 1956, we used a bar grizzly to separate fines from oversize ahead of the screens. With the grizzly we had to use one of our cranes full time to keep the bars cleaned off. This meant a loss of $3500 a month we could have been getting in rental money on the crane.

"So we replaced the grizzly with a Universal Wobbler Feeder and it's been a big improvement. It not only freed the crane but cut down our previous maintenance time to four hours a month.

"With the grizzly, we had two days welding time a week. So far, we don't see any wear on the Wobbler. This machine has handled more than half a million tons of slag for us—and before that, about a third of a million tons of granite. It's doing a swell job."

Harrington is talking about a real brute for punishment. The Universal Wobbler Feeder takes 60-ton dump loads all day for the Thomas Connelly Company. Self-hardening manganese steel bars resist wear—get tougher with use.

If you're in slag, cement, mining, quarrying, aggregate production or heavy, non-building construction, this machine has a record of proven performance that will interest you.

The Universal Wobbler has no equal in a heavy material handling job. It moves material and separates fines—a combination feeder-scalper that won't clog even in wet, sticky material. A wide range of sizes in different alloys are available to remove fines from 6" down to ½".

This is an ideal unit for increasing the capacity of primary or secondary crushers. We'll furnish users names on request and discuss your feeding, scalping and crushing problems at no obligation.

Tell us the kind of material to be handled, the percentage of fines in the feed, size of fines to be removed and the desired capacity in tons per hour.

PETTIBONE
UNIVERSAL
In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION

619 C Avenue, Cedar Rapids, Iowa

Subsidiary of Pettibone-Mulliken Corporation, 4700 W. Division St., Chicago 51, Illinois

If you convey this . . .

you need this . . .

QUAKER CONVEYOR BELTING FOR TOUGH SHOCK RESISTANCE!

The Quaker belt you see above is made especially to take the impact and abrasive wear of sharp, jagged loads.

Carcass is formed of multiple plies of strong, high-quality cotton duck, with skim coat between plies. Average cover tensile strength is 2500 to 3000 lbs.

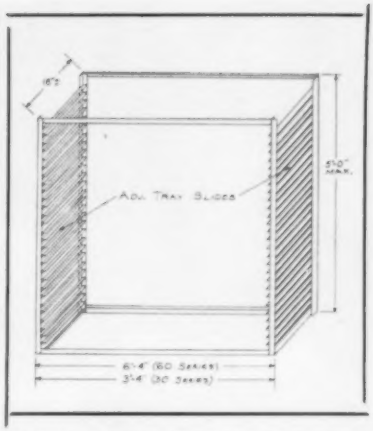
Do you need even greater troughability, flexibility or tension rating? Quaker can supply belts of new high tensile strength rayon or cotton-nylon fabrics. Any desired cover thickness.

Your Quaker Rubber-Quaker Pioneer Rubber distributor also carries a complete line of hose, packing and moulded rubber products for every use. Call him today.

For further information, write to: ***H. K. Porter Company, Inc., Quaker Rubber Works, Philadelphia 24, Pa., or Pioneer Works, Pittsburg, Calif.***

H. K. PORTER COMPANY, INC.

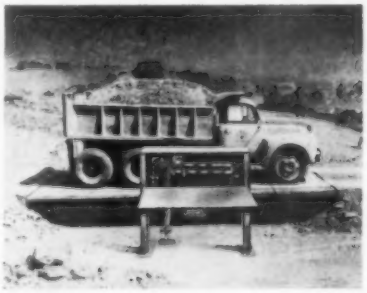
QUAKER RUBBER DIVISION



● The Tomco Products Company offers a complete line of core and sample storage products for the mining industry.

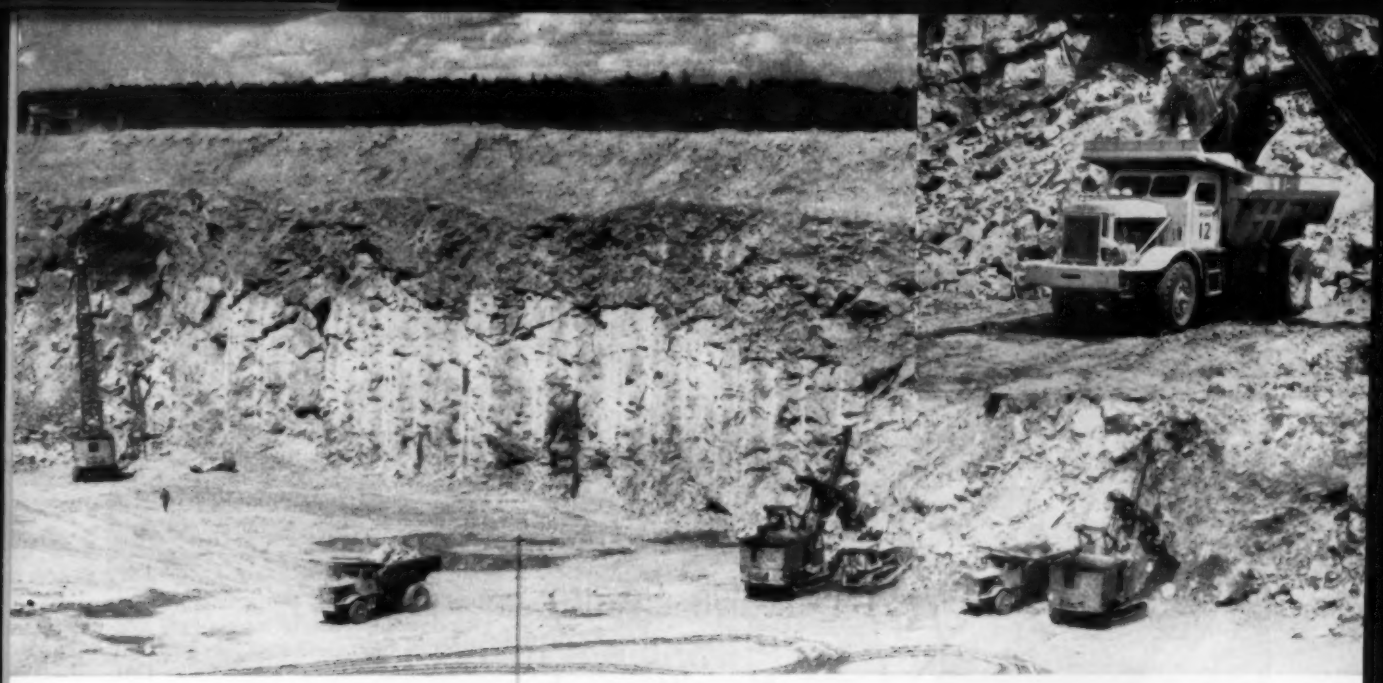
Tomco trays are made of galvanized steel or aluminum, in four standard sizes—1 in., 1⅛ in., 1⅜ in., and 2¼ in. They are made in two lengths—3 ft. and 6 ft.—and are approximately 18 in. wide. The troughs of the trays are formed for the core and are deep enough so that one tray can be stacked on top of another when loaded. The trays slide into the racks like drawers.

The rack is made of angles arranged so that one rack can be bolted to another. Because the tray slides are adjustable, different size core trays can be used in the same rack. Illustrated is the standard adjustable tray rack. **(68)**



● Portable vehicle scales requiring no pit are available from the Howe Scale Company in capacities to 70 tons and lengths to 60 ft. Additional scale sections can be joined for greater length and capacity.

Howe's Parallel Link Load Suspension assembly in the platform construction of the scales absorbs loading shocks and reduces wear on the scale pivots. A wide selection of weight indications is available—Standard Beam, Recording Beam, Dial Weightograph, Remote Dial, and many other methods. **(69)**



NATIONAL GYPSUM (Canada) Ltd. keeps stripping and production on schedule

with "Euc" Scrapers and Rear-Dumps

Euclid equipment proved its reliability and work-ability in the conversion of a peaceful farming area around Milford, Nova Scotia to a gypsum quarry.

Faced with moving a million bank yards of clay and 500,000 tons of gypsum rock, National Gypsum evaluated all makes of equipment—bought four "Euc" Scrapers, including an 18-yard Twin-Power model, and six 22-ton Rear-Dump Euclids for the rock movement. Sixteen months after the starting date, this big quarry site was stripped and graded—right on schedule. To fully clean the initial 15-acre quarry block, 7 million yards of clay are expected to be moved.

During early production at the quarry, four Rear-Dumps were hauling 5500 tons of ore to the hopper in an 8-hour shift. The haulage fleet is now composed of 10 of these reliable 22-ton "Eucs" used in the quarry and in the stripping operation in conjunction with a dragline. Six Euclid trucks currently used in the quarry deliver up to 1000 tons of gypsum per hour to the primary crusher bin.

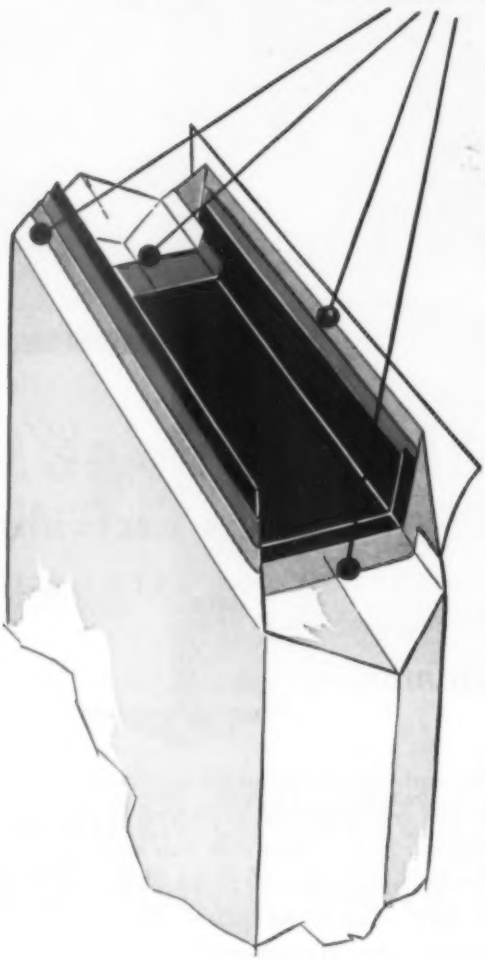
Have your Euclid dealer give you information on the complete line of Scrapers, Rear-Dumps, Bottom-Dumps and Crawler Tractors... he has proof that ***Euclids are your best investment.***

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

Bemis STEPPED-END pasted valve bags are "stepped" FOUR places



to give you . . .

Excellent valve closure

No sifting at bag corners

Added strength

Easy handling

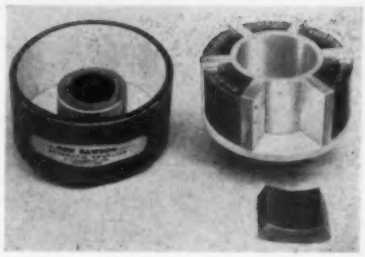
A very clean package

The Bemis design "steps" the plies in *four* places . . . not just two . . . to give the bag ends the *maximum* bond. Naturally, this provides the *maximum* siftproofness, cleanliness and strength. Bemis Standard Cement Bags have led in quality for years. Bemis Stepped-End Cement Bags lead the field in this new construction.

Bemis is your best source for whatever type of cement bag you need

Bemis

General Offices—
408 Pine Street, Box 43
St. Louis 2, Missouri
Sales Offices in Principal Cities



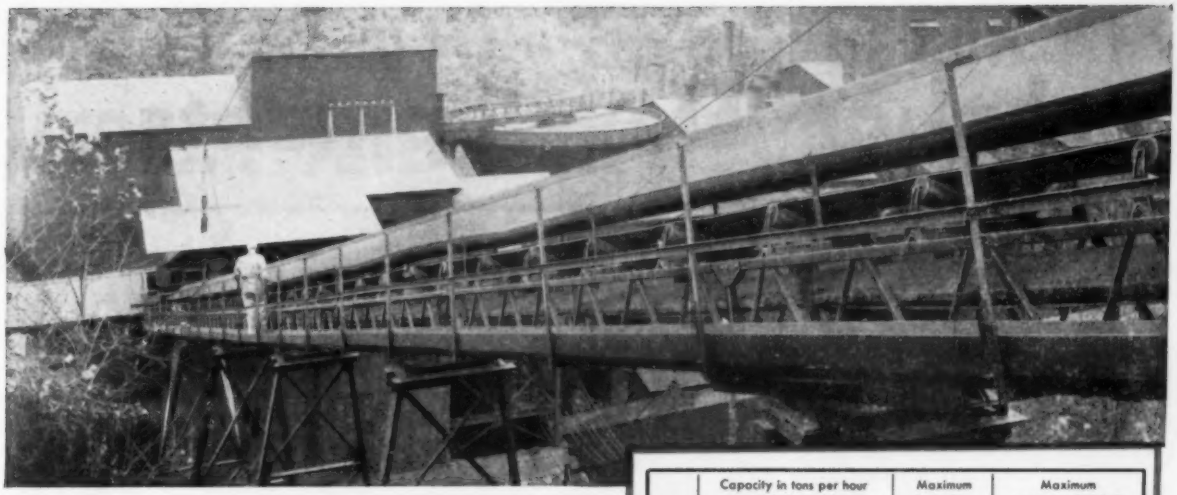
● The Rawson Coupling Division of O. S. Walker Company, Inc., announces a newly-designed coupling featuring a special metallic shoe which conducts the heat away from the drum. This automatic heat transmission eliminates heat checking and is said to cut generated heat into the drum by nearly two-thirds.

Other features of the coupling include elimination of torque fade and greater heat dissipation on high inertia jobs. (70)

● Sumo Pumps, Inc., announces the availability of the Sumo electrical submersible drainer pump, a single-stage centrifugal-type pump capable of handling water containing up to 20 percent solids.

The pump operates either partly or completely submerged, and has a capacity of 460 g.p.m at 15-ft. head. With a 70-ft. head, the unit will handle 145 g.p.m. A built-in thermostatic cut-off protects the motor against damage from overheating, obstructions, or overloading. A built-in automatic reset restarts the pump when obstructions are removed.

The heavy-duty, squirrel-cage, three-phase, 60-cycle, submersible-type motor is rated at 7½ hp. The pump has a closed impeller mounted directly on the motor shaft. Specially designed back blades keep foreign matter from the motor seal. (71)

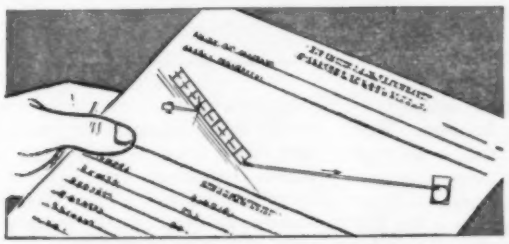


For lower costs down the line
make your belt conveyors

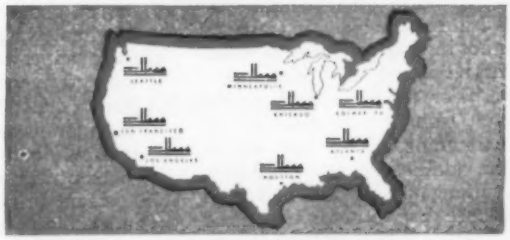
PRE-BILT by LINK-BELT

Belt width, inches	Capacity in tons per hour at belt speed of 100 FPM			Maximum lump size, inches		Maximum recommended belt speed, FPM	
	Weight of material, lbs. per cu.ft.			Sized	Unsized	Half maximum size lumps	Maximum size lumps
	50	75	100				
18	27	40.5	54	3	5	400	300
24	50	75.0	100	4½	8	500	400
30	81	121.5	162	7	10	600	450
36	117	176.0	235	8	14	650	500

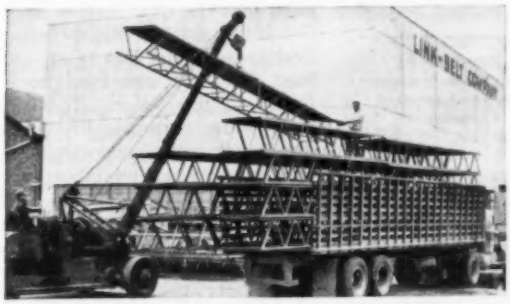
EASY SELECTION. Your Link-Belt engineer will help you choose the best combination from a wide selection of PRE-BILT sectional belt conveyor components.



PROMPT ESTIMATES. From standardized data, an "on-the-site" quotation can be prepared covering the components for your needs.



SPEEDY DELIVERY. Standardized parts are shipped from the nearest of 8 plants. One-source availability eliminates the delay of coordinating purchases from several suppliers.



FAST INSTALLATION. Due to simple construction and shop-assembled components, you can do your own erecting. Link-Belt also furnishes complete erection service and supervision.

Link-Belt PRE-BILT sectional belt conveyors combine operating efficiency and economy to give you years of dependable, profitable operation.

For full information on these durable conveyors up to 36 in. wide—with drives up to 40 hp, 24 and 42-inch truss depths—contact your nearby Link-Belt office, or send for Book 2579.

LINK-BELT

14,702

BELT CONVEYORS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World.

Labor Developments

How Well Are the Unions Doing?

By S. HERBERT UNTERBERGER

S. Herbert Unterberger and Company
Economists-Consultants on Labor and Industrial Relations

Washington, D. C.-Philadelphia, Pa.

DESPITE recent setbacks in organizing results, associated primarily with the revelations before the Senate Committee on Improper Activities in the Labor or Management Field, reports based on recent tabulations of union strength demonstrate beyond doubt that trade unions have achieved a firm position from which they are unlikely to be dislodged.

A report issued recently by the U. S. Bureau of Labor Statistics shows that during 1956 approximately 18½ million persons belonged to labor unions with headquarters in the United States. This is an increase of almost 750,000 over the corresponding figure for the previous year of 17,750,000. Approximately one million of these members were located outside the continental United States, principally in Canada.

This not insignificant growth must, however, be placed in its proper perspective. For the most part, it did not result from the organization of new bargaining units, but rather from the addition of new employees in bargaining units which had been in existence previously. Unionized establishments hired additional employees who, almost automatically, became union members.

Thus, the nation's labor force also increased, and when total union membership is related to the total labor force, it should be noted that the *proportion* of union membership has not changed. For some years now, including the last few years, the ratio of 1 union member for every 3 employees in non-agricultural establishments has remained fairly constant.

This was not always so. From the low point in 1932 to 1945, union membership in the continental United States increased from approximately 3 million to 14 million. In 1932 unionized workers constituted about 11 percent of non-agricultural employment; by 1945 they constituted about 35 percent, a more than three-fold increase. Since 1945 the growth in union membership, while constant, has been at a much slower rate, to about 17.5 million. This has kept pace with the employment expansion but has not exceeded it; therefore the proportion today of union members is still around 35 percent of non-agricultural employees.

Coverage of Union Agreements

All union members are not necessarily covered by labor agreements. On the other hand, many labor agreements cover not only union members but also employees who have not joined the union. By coincidence, these two groups appear to be of about equal size, so that approximately 18½ million employees appear to be covered by union agreements.

Almost half of these workers are in the manufacturing industry. The next most significant groups are the 15 percent in transportation and the 12 percent in contract construction. The least important group is the 0.3 percent in wholesale and retail trade.

The intensity of unionization varies significantly from locality to locality. A study was completed recently by the Bureau of Labor Statistics on the proportions of workers in large and medium-sized establishments covered by labor-management agreements in 17 labor market areas in the winter of 1956-57. The accompanying statistics were recorded for plant worker and office worker unionization.

The cities are listed from the most to the least intensively unionized, and separate statistics are tabulated for plant and office workers.

Labor Market Area	Ratio of all plant workers under labor-management agreements
San Francisco-Oakland	95 plus
Seattle	95 plus
Pittsburgh	90-94
Cleveland	90-94
Buffalo	85-89
Minneapolis-St. Paul	85-89
New York	80-84
Philadelphia	80-84
Kansas City	80-84
Portland, Oreg.	80-84
Birmingham	75-79
Los Angeles-Long Beach	75-79
Boston	70-74
Chicago	70-74
Atlanta	50-54
Memphis	50-54
Dallas	45-49

Labor Market Area	Ratio of all office workers under labor-management agreements
Seattle	25-24
Pittsburgh	20-24
Los Angeles-Long Beach	20-24
Boston	15-19
Buffalo	15-19
Philadelphia	15-19
Atlanta	15-19
Chicago	15-19
Kansas City	15-19
Portland, Oreg.	15-19
San Francisco-Oakland	15-19
New York	10-14
Dallas	10-14
Cleveland	10-14
Minneapolis-St. Paul	10-14
Birmingham	5- 9
Memphis	5- 9

These tables show, first of all, the wide discrepancy between the intensity of unionization between plant and office workers. The most completely unionized city with respect to office workers is less completely unionized (less than 30 percent) than the least completely unionized city with respect to plant workers (more than 44 percent).

The first table, which relates to plant workers, shows the expected results, that the most intense unionization is found in the highly industrialized areas in the Far West, and the least intensely unionized areas are found in the South. It also contains some surprises, for example, the fact that the proportion of plant workers covered by labor management agreements was as high in Birmingham, Ala., as in Los Angeles, higher than in Boston and Chicago, and only slightly below New York or Philadelphia. This is an important reflection of the strength of the Steel Workers Union, even in this Deep South area.

In the second table, which relates to office worker unionization, Seattle

(*Continued on page* 83)

NEW HUSTLE FOR '58 . . . CHEVROLET MEDIUM- AND HEAVY-DUTY HAULERS

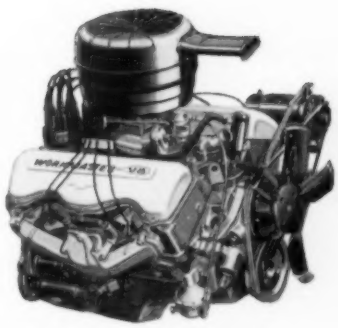
New V8 power! New 6 stamina!

New Chevrolet trucks bring you modern V8 engines with more staying power . . . great 6's built to keep on delivering on job after job after job. And a V8 so new in design it even looks different on the outside!

Here's *modern* truck power from Chevrolet! Standard in middle-weight Series 50 L.C.F. models is a new edition of the Heavy-Duty Taskmaster V8 with 160 h.p. for fleet hauling and new durability features such as Stellite-faced exhaust valves. Standard in Series 60 models is the famous Jobmaster 6 with more power than ever (150 h.p.) and more built-in dependability as well.

And standard power in Series 70 and 80 models is new and better, too! The big Heavy-Duty Super Taskmaster V8, rated at a high 175 h.p. brings you new features that mean dollar-saving efficiency on jobs that work a truck hard.

But that's not all! Series 90 and 100 trucks provide a *new kind* of big truck power, the 230-h.p. Workmaster V8, with revolutionary Wedge-Head design. It develops high power and torque at fuel-saving low r.p.m. See your Chevrolet dealer about Chevy's new brand of hustle! . . . Chevrolet Division of General Motors, Detroit 2, Mich.



All-new Workmaster V8 with Wedge-Head design! Combustion chambers are wedge-shaped to get extra power, top economy from regular grade fuel!

Latest editions of the "Big Wheel" in trucks

NEW CHEVROLET TASK-FORCE 58 TRUCKS

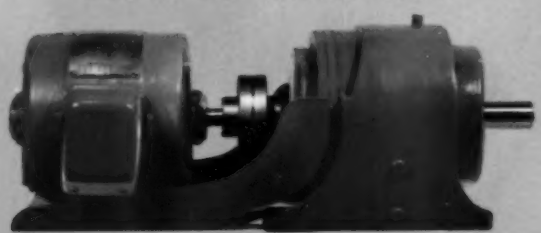
CHEVROLET

A great gear-motor

NEW integral unit

Compact, one-piece unit has complete, easily removable motor, machined-in alignment.

NEW all-motor unit



Providing wide application flexibility, motor change may be accomplished without disturbing gear.

General Electric's NEW gear-motor line

Now, you can meet all your low-speed drive requirements from a brand new line of General Electric packaged power transmissions. This 3-unit line is based on a new, completely simplified, helical design that has evolved from General Electric's 25 years of gear-motor engineering and application experience. And it's a line that can provide you with important, 3-way savings on all low-speed applications.

1. Greater reliability: This new line incorporates the most advanced gear manufacturing methods and all units are factory tested before shipment. In addition, you benefit because you purchase both motors and gears from a single manufacturer.

2. Easier Maintenance: A cinch to assemble and disassemble, alignment is machined right into each unit. Gear components may be carried in stock as sub-assemblies, minimizing downtime for normal repair.

3. Reduced inventory: You can reduce your inventory with no sacrifice to your operating continuity. Parts standardization and interchangeability permit a basically lower inventory investment.

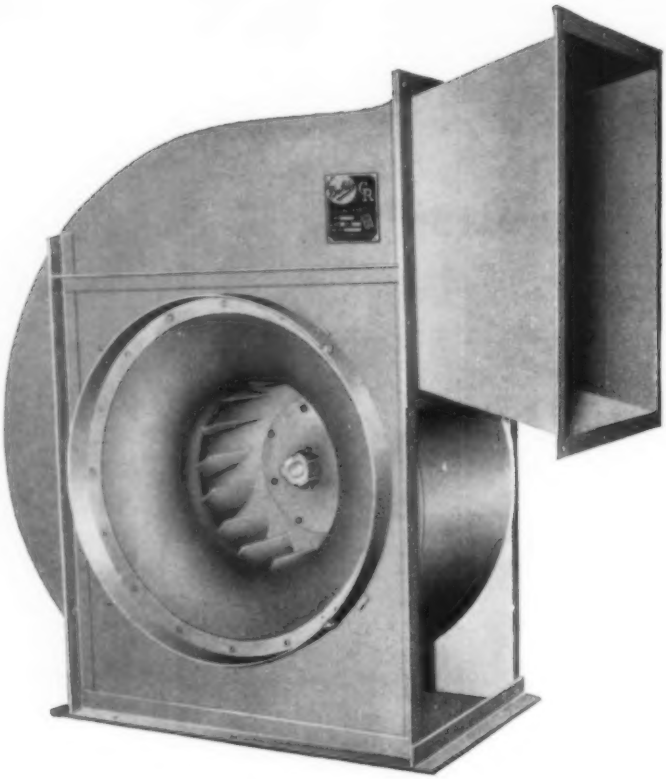
This new line was developed to keep pace with the new requirements and wider applications of gear-motors brought about by advanced manufacturing techniques. *Get complete information from your nearest Apparatus Sales Office or Distributor—or write for bulletin GEA-6704, containing line highlights, to General Electric Co., section 851-6, Schenectady, N. Y.* Gear-Motor and Transmission Components Dept.

NEW separate reducer

Unit can provide a variety of output speeds with change of belt or chain rates.

Progress Is Our Most Important Product

GENERAL ELECTRIC



MAXIMUM FAN LIFE

for KILN EXHAUST

OFFERED BY "BUFFALO" TYPE "CR" RADIAL BLADE FANS

The newly designed "Buffalo" Type "CR" Fan was engineered and built to give you a long life of useful service with a minimum of maintenance. Designed for punishing industrial operations, its rugged, wear-resistant construction assures you of dependable, trouble-free performance. That's one realistic economy feature.

The radial blade feature of the "Buffalo" Type "CR" Fan combines impressive performance with resistance to abrasion. The mating sections of the inlet wheel flange form a true half-circle, with no flat sections or irregularities. The result is a smooth flow of air, which cuts wear to a minimum . . . delivers peak performance for fans of this type.

The "CR" can save you money in other ways, too. For example, its high-capacity, high-pressure characteristics may enable you to install a smaller, less-expensive fan in many direct-connected applications.

All in all, the "Buffalo" Type "CR" Radial Blade Fan offers you a highly desirable combination of features: favorable first cost . . . high efficiency . . . long life. Contact your nearest "Buffalo" Engineering Representative for full information on the "CR" — or write for Bulletin FD 205.

Engineered into every "Buffalo" Fan is the famous "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.

BUFFALO FORGE COMPANY
BUFFALO, NEW YORK
Canadian Blower & Forge Co., Ltd., Kitchener, Ontario

"Buffalo"

VENTILATING AIR CLEANING AIR TEMPERING COOLING HEATING INDUCED DRAFT PRESSURE BLOWING EXHAUSTING FORCED DRAFT

National Lime Association Lists 1956 Safety Winners

SEVENTEEN lime plants entered in the 1956 National Lime Association Safety Competition, conducted by the Bureau of Mines, United States Department of the Interior, have received the association's Certificate of Achievement in Safety in recognition of outstanding safety performance. These plants, each of which operated throughout 1956 with no lost-time injuries, are classified in four groups as follows:

Quarries with calcining plants working 100,000 or more man-hours—Plymouth Meeting plant, Plymouth Meeting, Pa., operated by G. and W. H. Corson, Inc., 355,680 man-hours.

Galloway lime plant, Galloway, Mo., operated by Ash Grove Lime and Portland Cement Co., 291,735 man-hours.

New Braunfels lime plant, New Braunfels, Tex., operated by United States Gypsum Co., 263,604 man-hours.

Gibsonburg plant, Gibsonburg, Ohio, operated by Kelley Island Company, Division of Basic Refractories, Inc., 133,600 man-hours.

Millville plant, Harpers Ferry, W. Va., operated by Jones and Laughlin Steel Corp., Blair Limestone Division, 132,360 man-hours.

Cleburne plant, Cleburne, Tex., operated by Texas Lime Co., 112,768 man-hours.

Quarries with calcining plants working less than 100,000 man-hours—Lee plant, Lee, Mass., operated by Lee Lime Corp., 90,500 man-hours.

Sloan plant, Las Vegas, Nev., operated by U. S. Lime Products Corp., 88,800 man-hours.

Manitowoc plant, Manitowoc, Wis., operated by Rockwell Lime Co., 47,939 man-hours.

Underground mines with calcining plants—Bell plant, Bellefonte, Pa., operated by Warner Company, Bellefonte Division, 552,357 man-hours.

Hannibal plant, Hannibal, Miss., operated by Marblehead Lime Co., 106,632 man-hours.

Quincy plant, Quincy, Ill., operated by Marblehead Lime Co., 54,207 man-hours.

Calcining plants only—South Chicago plant, Chicago, Ill., operated by Marblehead Lime Co., 102,990 man-hours.

Ludington plant, Ludington, Mich., operated by Dow Chemical Co., Ludington Division, 96,008 man-hours.

Springfield Lime plant, Springfield, Mo., operated by Ash Grove Lime and Portland Cement Co., 80,353 man-hours.

Buffalo plant, Buffalo, N. Y., operated by Kelley Island Co., Division of Basic Refractories, Inc., 80,134 man-hours.

Houston plant, Houston, Tex., operated by Nyotex Chemicals, Inc., 32,513 man-hours.

At these 17 operations, the men worked an aggregate of 2,622,180 man-hours with no lost-time injuries. This total was a little more than 25 percent of the 10,362,008 man-hours worked by the 44 plants enrolled in the 1956 competition. Except for 1952, this was the only time in the 22 years of the competition that so many have been injury-free and received awards from the Association. The perfect safety records achieved at these plants clearly indicate that their employees, supervisors, and management co-operated as well-knit units in effective day-to-day safety programs.

The injury experience of the 44 participants enrolled in the 1956 contest was much more favorable than that of the previous year. The injury-severity rate of 1.699 was the lowest since 1952 and lower than the overall rate of 3.285 for the 22 years of the contest. The frequency of injury-occurrence, 13.318, was the lowest attained since the competition was started in 1935, and was almost 50 percent lower than the 22-year overall rate of 26.031.

The 44 participating plants worked a total 10,362,008 man-hours and experienced 138 injuries, one of which resulted in death, 10 in permanent partial injuries, and 127 in temporary total disabilities. The lower severity rate resulted from fewer fatalities and less severe temporary injuries. The days lost for each temporary injury was lowered by 6 days, from 28.7 in 1955 to 22.6 for 1956.

Of the four groups of plants into which the contest is divided, the injury-frequency was highest for quarry and calcining plants that operated less than 100,000 man-hours. The injury-severity rate was lowest for the group of calcining plants only and highest for the similar group showing the lowest frequency.

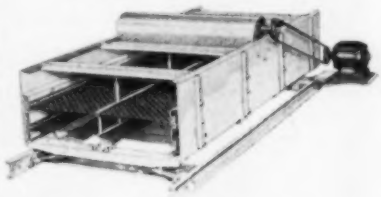
Burns, falls of persons, handling materials other than rock, machinery, and haulage were the 5 leading causes of injuries at the 44 competing lime plants in 1956, accounting for 59 percent of all injuries with stated causes. The most severe injuries occurred in the machinery classification, with 1 fatal, 5 permanent partial, and 5 temporary total accidents. The next most severe cause was from falls and slides of rock, with haulage, falling objects, and handling materials other than rock following in succession. These 5 causes accounted for 91 percent of all days lost for injuries with given classifications. It is interesting to note that comparison with 1954 and 1955, shows the frequency of injuries for the same causes as for 1956 to be 59 and 71 percent, respectively.

This annual contest, sponsored by the National Lime Association and conducted by the Bureau of Mines, U. S. Department of the Interior, is open to any plant that produces lime or dead-burned dolomite of which all or a portion of the resultant product is sold commercially.

Applications for enrollment and rules may be obtained from the Branch of Accident Analysis, Division of Safety, Bureau of Mines, Washington 25, D. C.

Marquette Cement Company, Chicago, Ill., reported a net icome of $5,852,872, equal to $2.18 per common share for the 9-month period ended September 30, 1957. This is a slight drop from the similar year ago period, when the firm earned $5,926,665 or $2.20 a share. Earnings for the third quarter were $3,230,517 or $1.22 per share as against $2,737,745 or $1.02 last year.

WHY IS THIS SCREEN A GREAT BUY?



- You pay less at the start
- Less expense on repairs
- Less downtime
- Upgrade your product

Proof: HUNDREDS OF UNIVERSAL SCREENS IN DAILY OPERATION FROM COAST TO COAST

Write today for free catalog #150

UNIVERSAL VIBRATING SCREEN CO.
Racine, Wisconsin
Quality Screens Since 1919

On their way to deliver...

Full Rated Year After

On the record, B&W Type EL Pulverizers — like these five shown prior to installation at Whitehall Cement Manufacturing Co., Cementon, Penna. — have established outstanding records for sustained production in extended continuous service. They have consistently delivered full rated capacity year after year for substantial savings to many individual companies.

Some of the reasons for this record of highly efficient, economical rotary kiln firing with wet or dry coal of widely varying grades, include:—ball-bearing grinding . . . heavy duty construction . . . low maintenance . . . automatic pressure lubrication . . . closely controlled rate of delivery of uniformly fine coal to burners, regardless of wear of grinding elements . . . high availability . . . low power consumption.

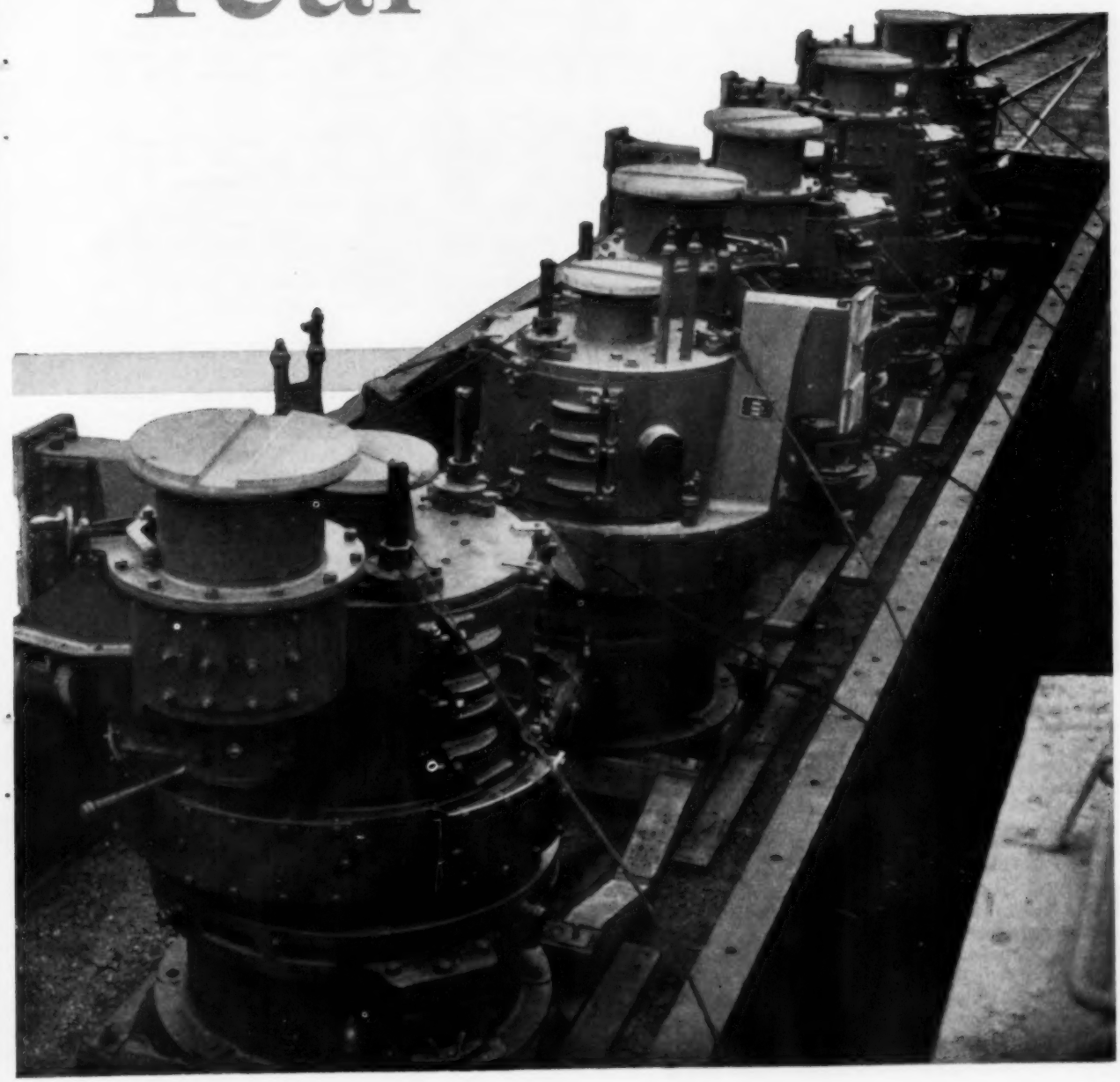
On the record, for uniform performance in the direct-firing of any type or size of rotary kiln, you can depend on B&W Type EL Pulverizers. The Babcock & Wilcox Company, Boiler Division, Process Equipment Dept., 161 East 42nd Street, New York 17, N. Y.

BABCOCK & WILCOX

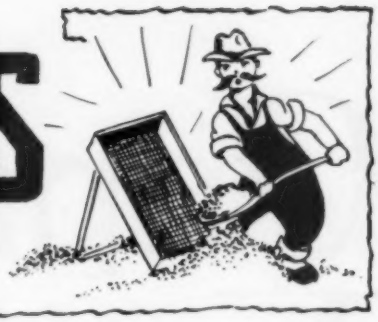
BOILER DIVISION

C-209

Capacity Year



SCREENINGS



By RAY L. SMITH JR.

WHAT we wish for you, at this Christmas season, is as easy as falling off the old log. There are no dry books to read or courses to study, nothing to practice. It's very, very simple, and we think more than any other reason it accounts for the success of those who are successful —and yet we do not recall ever seeing it explained before in three short words.

Of course, you may not need the suggestion. In that case, put this page away and resume whatever you were doing. We doubt, however, that any successful person would consider it necessary to give you the suggestion, since to them it is so obviously essential to success. This suggestion is: HAVE MORE FUN!

That's the secret. Stop pressing. Enjoy the job. Have fun. Not the kind of fun, of course that you may have at a football game, on a fishing trip, or at your club, but that warm feeling of satisfaction you get from a job you *like* to do, and which has been well done. As Dickens wrote, "His own heart laughed, and that was enough for him." Once you accept this mental attitude, all the old inhibitions vanish. You *can't* be unfriendly, intolerant, unsympathetic to a customer and have fun. Push not this suggestion aside. The secret is—Have More Fun.

We hope that you and yours—all that call your place *home*—have happiness and fun together on Christmas Day. For your friendship through this page, and in many other ways, we . . . "Thank you very kindly." Cheerio!

Take It Easy

HOW long do you think it takes a freight train half a mile long, to pass a crossing? It takes only two minutes. A passenger train does it in about 10 seconds. It's just a short wait in either case, yet many motorists risk their lives and the lives of their passengers trying to save this little bit of time.

Helps—Or Does It?

WHEN we get all hot and bothered over the magnitude of some of our problems and are inclined to take ourselves and our affairs with too much seriousness, a few astronomical facts will help us regain perspective.

Director Donald H. Menzel of Harvard Observatory reminds us that in our own galaxy there are approximately one hundred billion stars. There are probably more than a million galaxies within reach of our telescopes. If we assume that each star has ten planets around it, the total number of planets (like our earth) would run into a billion billion.

Weightless Space

IN CASE you've been concerned about comfort in the coming age of interplanatary travel (*some* people must be), the Air Force School of Aviation Medicine scientists have some reassuring news. Weightlessness—the kind encountered in space —is thoroughly enjoyed by about half the people experimentally exposed to such conditions. Some one-sixth had no reaction. The rest? . . . (*Whoops, sorry we brought the subject up.*)

Potpourri and Succotash

"Well, where've you been?" demanded the angry farmer of his overdue hired man. "You should'a had these mules back hours ago!"

"Sorry, Mister Jenkins," answered the boy. "On my way back from town I gave the parson a lift, and the way I had-da talk, with his sittin' right there in the wagon, them mules didn't understand a word I said!"

Dad: "Did you have the car out last night?"

Junior: "Yes, Dad; I took some of the boys home."

Dad: "Well, tell them I've found two of their lipsticks!"

"Aren't you ashamed," roared the indignant judge, "to have your wife support you by doing such menial labor?"

"Well, yes, in a way, your honor," answed the man. "But it's not my fault—she's too ignorant to do anything else."

"Mrs. Smith," said her daughter's schoolmate, "Ellie told the teacher that you threw a hairbrush at Mr. Smith last night."

"What?" cried the horrified mother. "Ellie, why on earth did you tell her that?"

"Well," answered the child simply, "she didn't know it."

Overheard at the late-late show at a local bar: "I resent your remark, sir," hiccupped a steady drinker, "and I'll give you just five seconds to take it back!"

"Oh, yeah?" snarled the other. "Suppose I don't take it back in five seconds?"

The drunk eyed him warily.

"Well," he said, "how much time do you want?"

The angler had just landed a fish when the inquisitive woman chanced to pass.

Woman: "Oh, that poor little fish!"

Angler: "Well madam, if he'd kept his mouth shut he would not have gotten into this trouble."

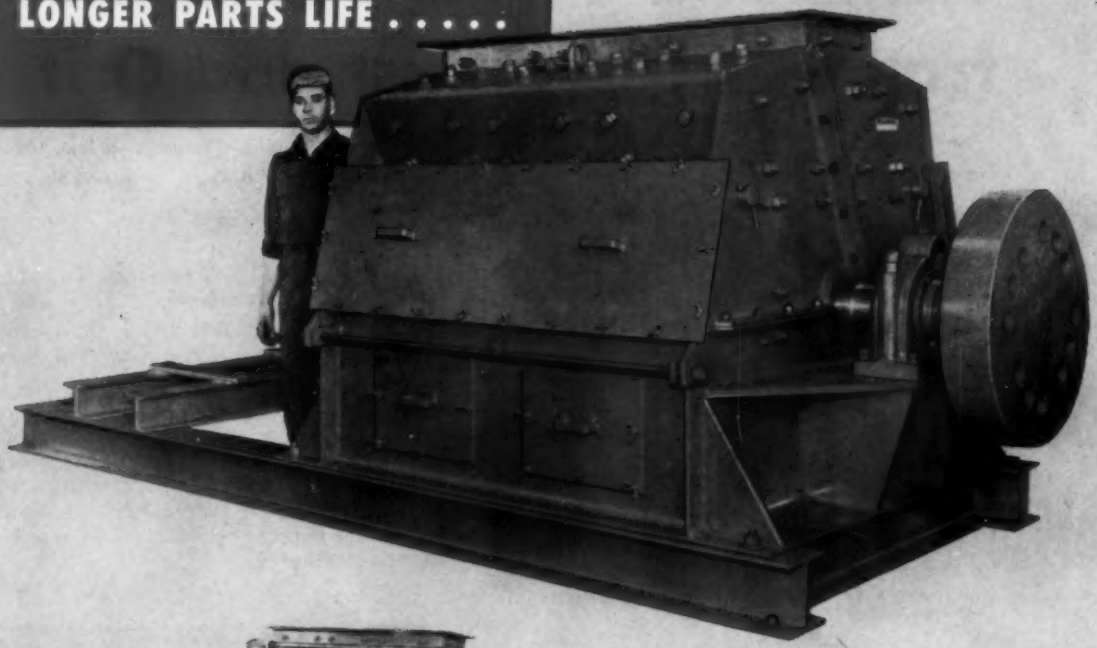
A man and a dog came into a bar where the man ordered two cocktails. When they came he handed one to the dog who promptly drank it, ate the glass until only the base and stem remained, walked to the door and left.

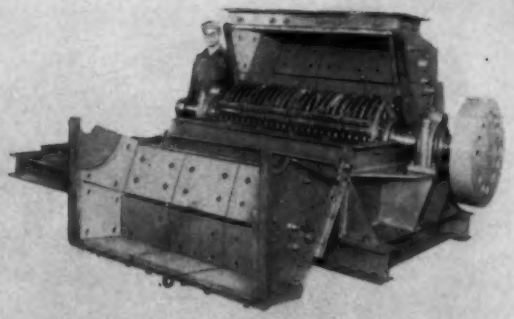
The bartender viewed this with amazement and announced that this was the craziest thing he had ever seen.

"Yeah," the man said, "he's a dumb dog. The stem is the best part."

NEW DUAL "2-POINT" ADJUSTMENT INSURES MORE UNIFORM GRINDING, LONGER PARTS LIFE . . . . .

WILLIAMS *Reversible* HAMMER MILLS





Williams Reversible Hammer Mill with cover open.
Note these features:

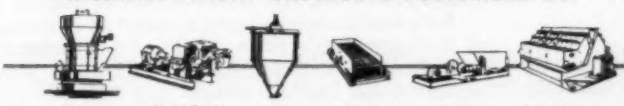
- Super-strong reinforced steel plate frame
- Renewable wear-resistant manganese steel liners
- Heavy duty oversize forged steel rotor shaft
- Anti-friction self-aligning roller bearings in dust-tight housings
- Complete accessibility to interior for quick parts changing

It's another Williams "first"—features not available in other hammer mills—that now makes it possible to maintain the original close clearances of *both* grinding plates *AND* cage sections against the rotating hammers. This easy-to-make "2-point" adjustment, in the most critical grinding area inside the hammer mill, gives absolute assurance of consistently uniform product quality.

In addition to the advantages of the Dual "2-Point" Adjustment, a Williams Reversible Hammer Mill substantially lowers upkeep expense by cutting hammer cost. Hammers can be operated in one direction today and another tomorrow simply by installing a simple reversing switch on the driving motor. Manual reversing of hammers no longer necessary. Grate bars also last longer. The double set of reversible manganese breaker plates, which last twice as long as other types, give four times the service! Maintenance and downtime are cut 50% or more.

Get all the facts about the hammer mill with *ALL* the top features.

WILLIAMS PATENT CRUSHER & PULVERIZER CO. • 802 ST. LOUIS AVE. • ST. LOUIS 6, MO.



WILLIAMS
CRUSHERS • GRINDERS • SHREDDERS
Oldest and Largest Manufacturers of Hammer Mills in the World

DAYTON COG-BELTS* Withstand 3-Year Punishment from Abrasive Dust and Grit

"Our Dayton Cog-Belts have been running 10 hours a day, 5½ days a week for over three years." — D. L. Howard, Plant Superintendent, Valley Quarries, Chambersburg, Pa.

"This set of eight Dayton Cog-Belts on our gyratory breaker is still in good condition even though every belt has taken constant punishment from abrasive grit and dust.

"Experience with other V-Belts taught us how destructive rock dust can be. It was one headache after another . . . with abrasive particles cutting the reinforcing cords or building up in the sheave grooves until the belts were forced off the sheave. All these troubles disappeared after we switched to Dayton Cog-Belts.

"We've found that clinkers or iron grit that would chew up a fabric-covered belt become imbedded in the Cog-Belt's raw-edge sides and have no harmful effect whatever.

"On all our other V-Belt drives, too — crushers, pulsators, conveyors — downtime has been extremely rare.

"Although V-Belts are only a small part of our investment here, they're very important to steady, efficient plant operation. That's why every one of the 134 V-Belts we use are now Daytons. And to top it all off, our Dayton supplier, the Industrial Motor Supply Company in Harrisburg, gives us one-hour service."

For more information and help in solving your power transmission problems, see BELTING in the Yellow Pages for the name and phone number of your nearest Dayton Distributor. *Or write The Dayton Rubber Company, Industrial Replacement Division, Dayton 1, Ohio.*

"You can see how rock dust collects around the average drive. Yet, this 3-year-old set of Dayton Cog-Belts is still almost as good as new." D. L. Howard is looking on while Ralph Peters, of Industrial Motor Supply, examines a Cog-Belt held by John Morgan, the Dayton Representative.

"Examine a Dayton Cog-Belt and you'll see why abrasives don't bother it. The space between each Cog picks up dust before it settles in the sheave and carries it out before trouble develops. The dust problem solved, there's nothing to cause distortion of the belt or force it out of the groove. We've noted, too, that the Cog-Belts seem to kick out stones that cause belts to flip over in the groove."

*T.M.

© D.R. 1957

Dayton Rubber *World's Largest Manufacturer of V-Belts*

DAYTON RUBBER COMPANY, INDUSTRIAL REPLACEMENT DIVISION, DAYTON 1, OHIO

Getting more usable horsepower

LINK-BELT SPEEDER machines have precision-made, heavier components to take this bonus engine power

To get an accurate gauge of shovel-crane work potential, it's important to make your comparisons on the basis of usable horsepower rather than engine size. Why? Because size for size, a Link-Belt Speeder delivers *more usable power or line pull* than other machines powered by the same make and model engine. And greater usable horsepower is bonus power that pays off in easier digging, faster cycles, more production and profits.

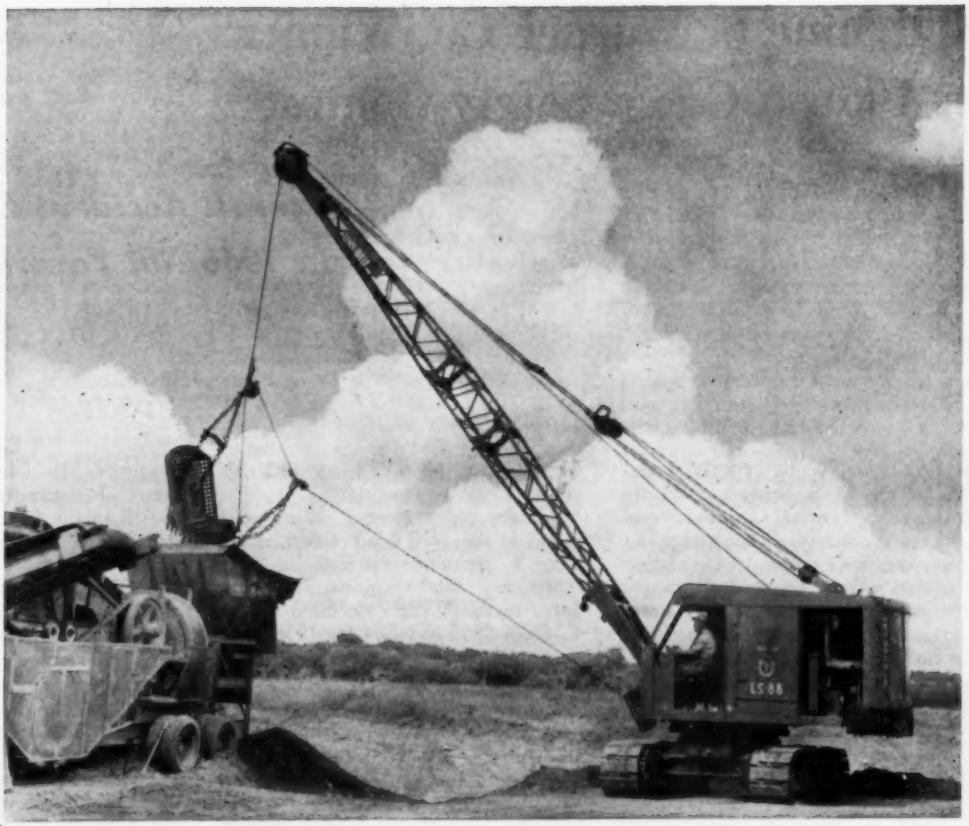
The variation in the amount of power a given engine actually makes available in the form of line pull (or power at the drums) is determined primarily by the net horsepower the engine delivers at the output shaft. Engine Model X, for example, when run at 1200 rpm, delivers *75 hp*. At 1600 rpm the same engine develops *100 hp!*

What permits greater horsepower

Because the Link-Belt Speeder line is the industry's most advanced in design —17 new models—it incorporates the latest development in engineering, metallurgy and fabricating. As a result, every Link-Belt Speeder is an "extra strength" machine — a shovel-crane with the added guts and stamina to take full advantage of the bonus horsepower available in each engine . . . at operating speeds well within the engine manufacturers' recommendations.

Only part of the story . . .

More usable horsepower is but one of many reasons why Link-Belt Speeder machines are completely revising existing profit and production standards. Why not see how you, too, can take advantage of Link-Belt Speeder "years ahead design" . . . earn a bigger return on your shovel-crane dollars. Contact your Link-Belt Speeder distributor for details or write Link-Belt Speeder Corp., Cedar Rapids, Iowa. 14.329



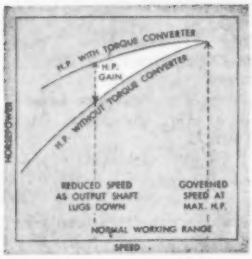
3-point check on usable horsepower

Check the engine manufacturer's "specs" to see what power the engine develops at various speeds. Check the shovel-crane manufacturer's "specs" to see at what speed the engine will be set. Then check the shovel-crane itself, see if shafts, clutches, gears and other components have the size and strength to take full advantage of bonus engine power. You'll have another reason why Link-Belt Speeder is today's top shovel-crane line.

Power hydraulic controls for speed with safety

Speed-o-Matic power hydraulic controls utilize oil under pressure (maintained by an engine-driven pump and variable pressure valves) to actuate clutches. Response is fast, smooth and positive. There's perfect feel of the load under all conditions . . . none of the customary jerk, jump or lag found with air or mechanical controls.

from shovel-crane engines.....



For even more effective use of power

The horsepower gain charted at left is yours with a Link-Belt Speeder equipped with a matched engine torque converter package. Available for all models, torque converters cut digging shock, reduce fuel consumption, match power to the load and reduce engine stalls.

Less chance for end-of-the-shift letdown

Because oil under pressure does all the work, the operator merely needs to flick short-throw levers. He stays fresh and alert, is actually encouraged to push the machine to its high limit all shift long.

It's time to compare . . . with

LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

Bell Mine of Warner Co. Winner In 1956 N.C.S.A. Safety Contest

Overall Accident Experience In 1956 Not Favorable

ACCORDING to reports issued by the U. S. Bureau of Mines on the 1956 National Crushed Stone Association Safety Competition in which Warner Company's Bell Mine won first place, the overall injury experience at the 76 crushed stone operations in the 1956 competition was not favorable. The injury severity rate of 4.359 per 1,000 man-hours of work was the highest of any annual crushed stone contest since 1948. The high severity rate in 1948 and again in 1956 resulted primarily from the 4 fatalities reported in each of these years. This was the greatest number of fatalities sustained since 1947, when there were 10. In 1956 there were 1 permanent total injury, 7 permanent partials, and 149 temporary total injuries at the enrolled plants, more than in any year since 1950. These injuries had a total time loss or charge of 37,311 days, which is an economic loss equivalent to 1,000 men working 37⅓ shifts.

The frequency rate for all the competing plants in 1956 was 18.809 per 1,000,000 man-hours. This rate was also less favorable than that of 14.445 for 1955, but more favorable than the overall frequency rate of 27.784 for the 31 years of the competition. The injury severity rate showed a 28 percent improvement over the corresponding 31-year average rate for enrolled operations.

Of the 76 enrolled operations in the 1956 competition, 64 were quarries and 12 were underground mines. The 64 quarries experienced a total of 145 injuries, 4 of which were fatal, 1 permanent total, 6 permanent partial, and 134 temporary total. The injury severity rate of 4.882 for these injuries was 69 percent higher than the corresponding rate of 1.535 for 1955, but was 1 percent more favorable than for the overall rate of 4.922 for the 31 years of the competition.

In the underground mines enrolled in the 1956 competition, there were 1 permanent partial, and 15 temporary total injuries. The injury severity rate declined from 4.786 in 1955 to 0.684 for 1956, and was appreciably lower than the overall average for the 31 years, which was 6.177.

The Bell mine of Warner Company, Bellefonte Division, at Bellefonte, Pa., had the best safety record of the operations enrolled in the contest. To win the bronze plaque provided by the *Explosives Engineer* magazine, this limestone mine operated 277,540 man-hours throughout 1956 without a lost-time injury —an outstanding achievement. The 1956 trophy award was the third that this plant had won in as many years. The Bell limestone mine has been a participant for 28 of the 31 years of this competition and during this time it has operated more than 6,000,000 man-hours with an overall frequency rate of 33.368 injuries, sustained per 1,000,000 man-hours of exposure to hazards of the crushed stone industry, and an injury severity rate of 5.846 days lost per 1,000 man-hours of work. It captured the coveted winner's bronze plaque in 1954, 1955, and 1956, and was awarded honorable mention in 1925, 1937, and 1951. The record of this mine clearly demonstrates what a well-designed program of accident prevention can achieve.

Second place was awarded to the New York Trap Rock Corporation's Tomkins Cove limestone quarry at Tomkins Cove, N. Y., which operated 272,097 man-hours without a disabling injury.

Third place went to the Bessemer limestone quarry of the Bessemer Limestone and Cement Company at Bessemer, Pa., for 227,152 man-hours of injury-free operation, and fourth to the Columbia No. 1 limestone quarry of the Columbia Quarry Company at Columbia, Ill., for 200,052 man-hours.

These four operations (combined) worked nearly 1,000,000 man-hours with but a single disabling work injury. To the employees, their supervisors, and the management of these organizations safety was no accident. Close teamwork and co-operation on the part of all concerned played the most important part, as it must in any successful endeavor.

Injury-Free Operations

The following 32 operations, 26 quarries, and 6 underground mines (the latter group including the trophy winner) achieved injury-free records for which they were awarded Certificates of Honorable Mention by the National Crushed Stone Association. These 32 plants were worked 2,835,875 man-hours, representing 33 percent of the total worktime of all plants enrolled in the competition.

Bell Mine, Warner Company—Bellefonte Division, Bellefonte, Pa.; 277,540 man-hours.

Tomkins Cove Quarry, New York Trap Rock Corp., Tomkins Cove, N. Y.; 272,097 man-hours.

Bessemer Quarry, The Bessemer Limestone and Cement Co., Bessemer, Pa.; 227,152 man-hours.

Krause No. 1 Quarry, Columbia Quarry Company, Columbia, Ill.; 200,052 man-hours.

Security Quarry, North American Cement Corp., Hagerstown, Md.; 172,500 man-hours.

Cheektowaga Quarry, Federal Crushed Stone Corp., Cheektowaga, N. Y.; 152,267 man-hours.

Pixley Mine, Stewart Sand & Material Co., Independence, Mo.; 121,700 man-hours.

Plant No. 1 quarry, The Callanan Road Improvement Co., South Bethlehem, N. Y.; 120,330 man-hours.

Kimballton Mine, Standard Lime and Cement Co., Pearisburg, Va.; 111,409 man-hours.

Oriskany Falls Stone Plant No. 5 Quarry, Eastern Rock Products, Inc., Oriskany Falls, N. Y.; 103,132 man-hours.

Woodleaf Quarry, Superior Stone Co., Woodleaf, N. C.; 100,853 man-hours.

Red Hill Quarry, Superior Stone Co., Charlottsville, Va.; 90,535 man-hours.

Bakerton Mine, Standard Lime and Cement Co., Bakerton, W. Va.; 87,672 man-hours.

Cedar Hollow Quarry, Warner Company, Devault, Pa.; 79,488 man-hours.

Oaks Corners Quarry, The General Crushed Stone Co., Geneva, N. Y.; 76,334 man-hours.

Watertown Quarry, The General Crushed Stone Co., Watertown, N. Y.; 69,650 man-hours.

Bakers Quarry, Superior Stone Co., Monroe, N. C.; 59,730 man-hours.

Jordanville Quarry, The General Crushed Stone Co., Jordanville, N. Y.; 59,092 man-hours.

Union Furnace Quarry, Warner Company—Bellefonte Division, Tyrone, Pa.; 53,685 man-hours.

Stafford Quarry, Genesee Stone Products Corp., Stafford, N. Y.; 53,130 man-hours.

Auburn Quarry, The General Crushed Stone Co., Auburn N. Y.; 52,919 man-hours.

Cape Girardeau Mine, The Federal Materials Co., Inc., Cape Girardeau, Mo.; 45,172 man-hours.

No. 8 Quarry, Columbia Quarry Co., Ullin, Ill.; 41,241 man-hours.

Prospect Stone Plant No. 6 Quarry, Eastern Rock Products, Inc., Prospect, N. Y.; 40,359 man-hours.

Webster Quarry, The Kentucky Stone Co., Irvington, Ky.; 36,054 man-hours.

Lutz Quarry, Consumers Company, Oshkosh, Wis.; 34 950 man-hours.

Avoca Quarry, Jefferson County Stone Co., Inc., Avoca, Ky.; 27,104 man-hours.

Tyrone Mine, The Kentucky Stone Co., Tyrone, Ky.; 24,792 man-hours.

Randville Quarry, Superior Rock Products Co., Sagola, Mich.; 12,757 man-hours.

Plant No. 4 Quarry, Southwest Stone Co., Knippa, Tex.; 12,161 man-hours.

Plant No. 2 Quarry, Catskill Mountain Stone Corp., Hudson, N. Y.; 11,376 man-hours.

Hickory Quarry, Superior Stone Co., Hickory, N. C.; 8,642 man-hours.

Statistics of the Competition

The overall safety record of the 76 operations enrolled in the 1956 competition was better than the 31-year average of the contest. Sixty-four open quarries completed the competition year with an injury-frequency rate of 19.351 per 1,000,000 man-hours and a severity rate of 4.882 days per 1,000 man-hours. Although these rates were less favorable than the '55 rates (16.136 and 1.535, respectively) they were nevertheless consistent with the long-term improvement made since the origination of the competition.

The injury frequency rate at the 12 competing mines was 14.997 and the severity rate was 0.684, showing the mines to have had more but less severe injuries than were disclosed by the similar rates for 1955. Both reveal a downward trend, when compared with the 31-year average rates of 26.898 and 6.177.

Causes of Injuries

Principal causes of injury among the 1956 competing participants were: falls of persons, resulting in 28 disabilities or 18 percent of all injuries with reported causes; falling objects, resulting in 15 percent; handling materials, 14 percent; machinery, 12 percent; and haulage, 10 percent. The most severe injuries during the 1956 competition resulted from explosives, haulage, handling materials, falls and slides of rock, and machinery. These five causes were responsible for 92 percent of the total number of days of disability.

The Competition

The winning operation in the annual National Crushed Stone Association Safety Competition is awarded a bronze plaque portraying in bas-relief the quarry scene on the pedestal of the "Sentinels of Safety" trophy awarded in the National Safety Competition. The plaque is furnished by the *Explosives Engineer* magazine. Each plant in the contest, except the winner, that operated throughout the year without a lost-time injury, is given an honorable mention award of a parchment certificate which is a reproduction of the bronze plaque. In addition, each employee of an accident-free operation is presented a Certificate of Honor.

This safety competition is designed specifically to promote safety in the crushed stone industry. It is conducted annually by the Federal Bureau of Mines and sponsored by the National Crushed Stone Association. It is conducted under the same rules as the National Safety Competition, and the same records are used in both contests. There are two additional qualifications for the N.C.S.A. competition—the operation must have commercial production of crushed stone, and the company must be a member of N.C.S.A.

A plant may be enrolled on application to the Branch of Accident Analysis, Division of Safety, Bureau of Mines, Washington 25, D. C.

Israeli Potash Firm Attains 7,000-Ton-per-Month Output

The Dead Sea Potash Works at Sodom, Israel, has exported a total of 53,000 tons of potash and marketed 5,000 tons locally. Production now averages 7,000 tons a month; and, since January 1, 1957, output has been doubled, compared with the same period of 1956.

The firm is also constructing a stockpiling plant, which is scheduled for completion in August, 1958.

Kenya's 2nd Cement Plant Being Built Near Nairobi

A new cement plant with an expected production capacity of 100,000 tons of cement per year is under construction on the Athi River near Nairobi, Kenya, Africa.

Cement operations in Kenya began in 1947, when clinker was imported. In 1954 a plant was built near Mombasa. Today this facility produces 150,000 tons of cement from local materials. The combined capacity of these two plants will eventually make Kenya self-sufficient in the cement field.

Dedicated in 1929, the Cascade Tunnel in the state of Washington passes through 7¾ miles of solid granite.

Johns-Manville Corporation, New York, N. Y., reported that 9-month earnings this year fell 24.4 percent below 1956—from $18,972,546 to $14,347,000, while sales rose 2 percent—from $228,847,783 to $233,307,000.

Labor Developments

(*From page* 68)

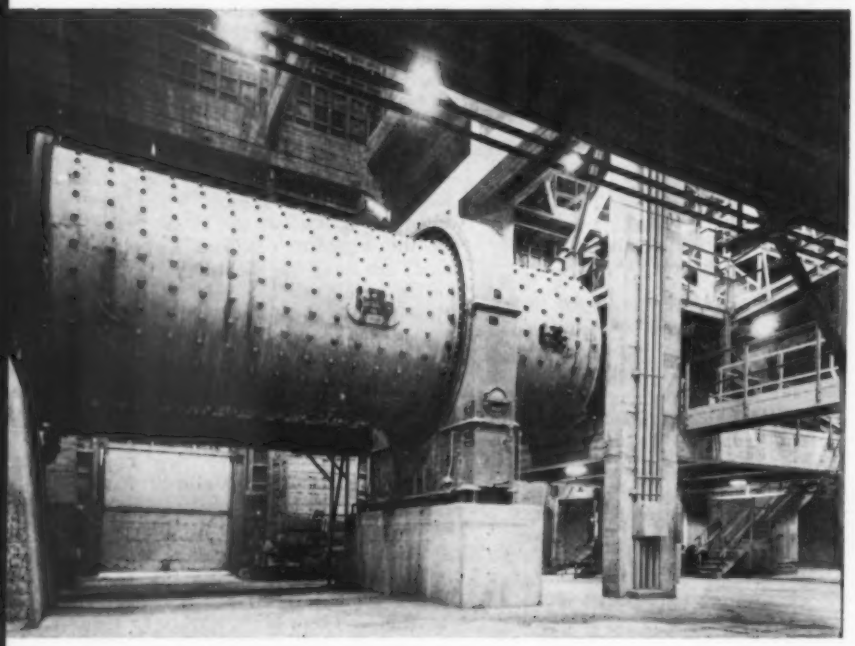
and Pittsburgh are also found near the top and Memphis near the bottom, but here the resemblance ends. A comparison of the two tabulations suggests strongly that there is no necessary relationship between the intensity of plant unionization and the intensity of office unionization. Los Angeles and Boston, which are near the bottom of the list in terms of the intensity of plant unionization, are near the top of the list for office unionization, while the situation is just reversed for Cleveland and Minneapolis-St. Paul.

Another southern city, Atlanta, furnishes a surprise with respect to office unionization by ranking up with Boston, Buffalo, Philadelphia, and Chicago and above New York, Cleveland, and Minneapolis-St. Paul.

In addition to the variations which these data demonstrate, it is equally important that labor unions have penetrated so deeply into all these areas, even those where, traditionally, their activity is discouraged.

New 2,000-Hp. Clinker Mills Installed in Montreal East Plant Of Canada Cement Company

By H. B. HOWE
Chief Engineer
Canada Cement Company



One of the two new 11- by 30-ft. clinker mills which are equipped with internal water spray cooling as the clinker comes direct from the kilns. Note the provision for ease of cleaning.

DURING the month of June, 1957, one of the newest concepts in clinker mills in the cement industry and in milling industry in general was put into service at Canada Cement Company's Montreal East plant. Two 2,000-hp. clinker mills, 11 ft. in diameter by 30 ft. long, were installed. This article, a progress report on the operation, gives some of the background in clinker grinding, both at this plant and other facilities of the company.

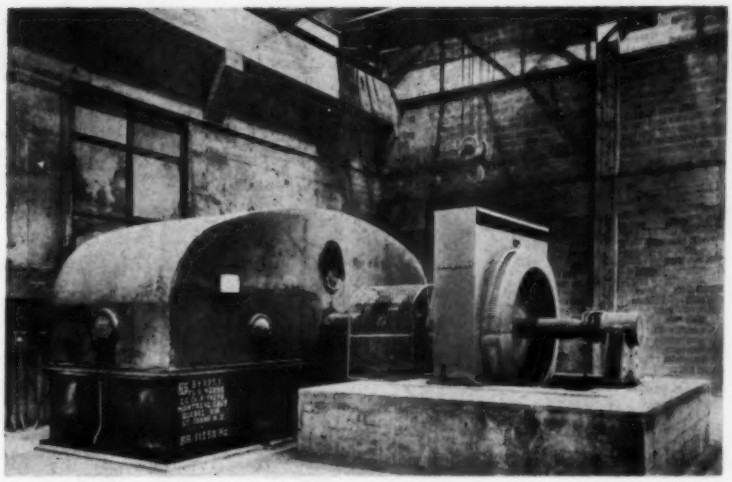
The original 1912 clinker mill consisted of a 2-stage grind, utilizing 15 No. 85 F. L. Smidth Kominuters and 19 No. 18 Smidth tube mills. The Kominuter is a ball mill with tubular screens mounted around it, which gives a closed-circuit grinding unit. The product passing through the screens is conveyed by the screw conveyors and elevators to feed bins for the tube mills. Originally the tube mills were lined with stone and used pebbles but in later years they have been changed to hard iron or similar linings with conventional grinding balls.

This mill department was able to grind about 75 bbl. per hour per Kominuter and 50 bbl. per hour per tube mill. The department output, therefore, was about 950 bbl. per hour. (All barrels referred to in this article will be 250 lb., which is the Canadian Standard.) This production capacity could take care of seasonal rushes, and with some modification has been able to make high-early-strength cement.

Since 1912 the Montreal East plant has been changed from dry to wet process and completely rebuilt from the crusher to the kiln departments. This has been described in previous articles in trade journals and need not be covered here.[1] The

[1] See PIT AND QUARRY, July, 1950, pp. 90-97. *Montreal Plant Typifies Growth of Canadian Cement Industry*, by Walter E. Trauffer.

internal water sprays facilitate efficient grinding of clinker direct from kilns



In a separate room are the two special gear reducer drives for new clinker mills and their 2,000-hp. synchronous motors.

seventh kiln was put in in 1956, being a 12-ft. by 450-ft. Traylor kiln, which brought the total clinker production to 22,000 bbl. per day. Considering maintenance, recharging, and other operating delays, the old clinker mill could not keep up with the kiln production. Added to this consideration was the fact that the market sometimes required several cements with different finenesses, which could not be made easily with the old mill system. It was decided to go ahead with the modernization program, and the new mill design was undertaken.

The post-war expansion program of the company involved the construction of new clinker mills at Belleville, Ont., Havelock, N.B., Exshaw, Alta., Winnipeg, Man., Edmonton, Alta., and Woodstock, Ont. A brief discussion of four of these departments will outline the development of thinking on clinker grinding by this company through the years.

In 1948 at Belleville,[2] the company constructed a 2-stage clinker grinding plant which can be described briefly as follows: weighing feeders under the bins feed three 9-ft. 6-in. by 13-ft. 2-in. 500 hp. single-compartment F. L. Smidth ball mills. The product of these mills is conveyed to a series of feed bins, under which screw feeders were mounted, feeding four 6-ft. 6-in. by 30-ft. No. 2030 Smidth Unidans, each with 600 hp. motors and 2 compartments. Each Unidan is in closed circuit with an air separator. Here we have a 2-stage grind, the second in closed circuit.

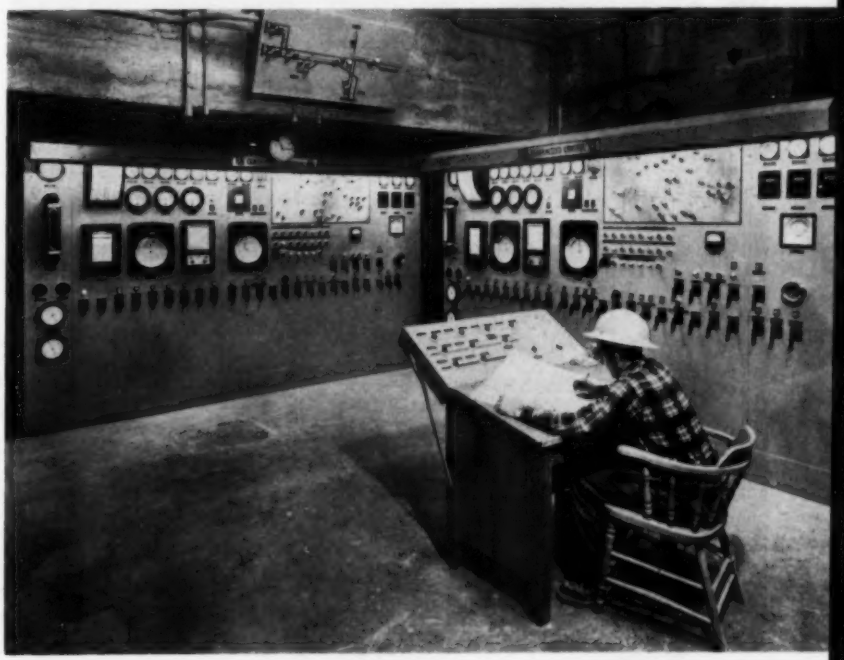
Since there was an off balance in the first stage of grinding, an additional 10- by 18-ft. 800 hp. Smidth ball mill was installed to balance up in the second stage, grinding closed-circuited with its own separator. Both Type I and masonry cement have been made in this department.

Difficulty arose in that the feed bins for the second stage filled with material and hardened, offering no surge capacity at all. Because of this the operation must be watched very carefully. The power consumption is about 7.3 b.hp. per barrel for the mill only, and 7.35 kw. per barrel for the total department. The ball mill charge is 68,000 lb., the 6-ft. 6-in. by 30-ft. mill charge is 99,000 lb., and the 10- by 18-ft. mill charge is 112,000 lb.

In 1951 two similar clinker mills were built, one in New Brunswick[3] and one in Alberta. In each case the

[2]See PIT AND QUARRY, November, 1949, pp. 88-96. *Canada Cement Company Expands Belleville Plant,* by Walter E. Trauffer.

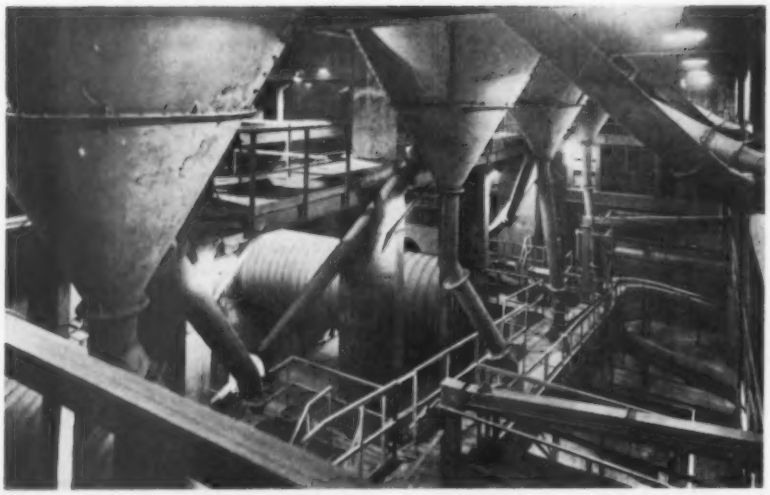
[3]See PIT AND QUARRY, July, 1952, p. 126 *et seq., Canada Cement Company's New Plant in New Brunswick,* by H. B. Howe.

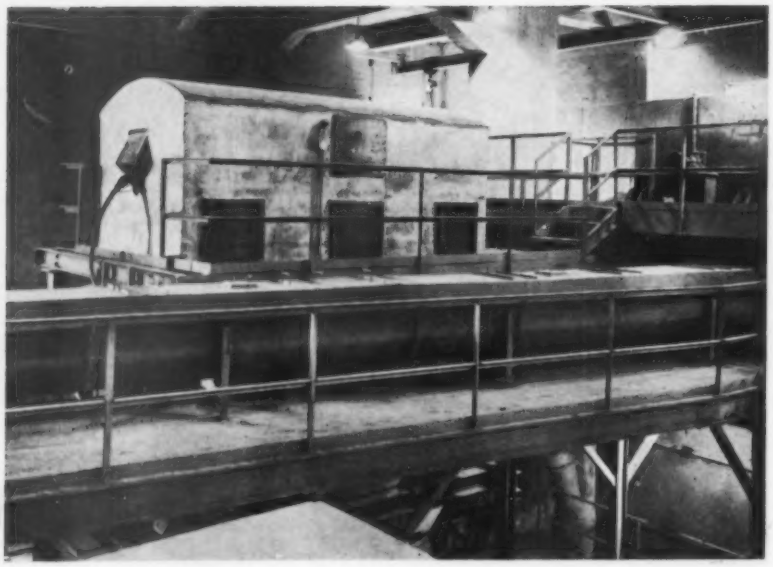


The control room for the two new clinker mills and their related equipment. The two control and instrument panels have illuminated flow diagrams of the mills and (above) a diagram of the transport lines.

One of the three suspended pivoted, constant-weight feeders which proportion clinker, gypsum, and limestone when masonry cement is being made, to one of the grinding mills.

This view of the clinker grinding department shows the two 11- by 30-ft. mills, each with two 16-ft. air separators. The dust collectors and return air conveyors are at the right.





The electrostatic precipitator which cleans the air and superheated steam from a mill before it is discharged to atmosphere. It is equipped for heating and is fully insulated.

circuit is as follows: Feeders under bins provide uniform feed to 9½-ft. diameter by 18-ft. 500 hp. Smidth ball mills, each one closed-circuited with an air separator. The production of these, from several units, is conveyed away by a Fuller pump. This development came along partially because of thinking which developed in the industry and because it was discovered at Belleville that the ball mill product contained from 20 to 40 percent minus 200-mesh material in one pass. The departments are simple as to equipment and have made only Type I cement, due to market demand. The power consumption is 6.1 b.hp. per barrel for the mill only, and 6.42 kw. per barrel for the total department. Each of these mills grinds about 100 bbl. per hour, and each is charged with 86,000 lb. of balls.

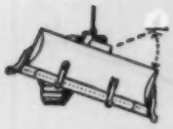
When the reconstruction of the Winnipeg plant was considered, it was thought desirable to construct mills as large as was considered practical with the experience of the time, to reduce the number of operating units. It was felt that an accumulation of clinker would have to be ground in the spring and summer months, and the possibility of demand for masonry cement in that area was to be provided for. Here, the installation,[4] in 1955 comprised two 11-ft. by 15-ft. 8-in. 1,000 hp. F. L. Smidth Symetro drive ball mills, each fed by Jeffrey Waytrols and each having two 14-ft. Sturtevant air separators. We have made Type I cement only in this mill to date, at a rate of about 160 bbl. per hour, the power demand being 5.7 b.hp. per barrel for the mill only, and 6.22 kw. per barrel for the entire department. The charge in this mill is 116,000 lb. of balls.

The Winnipeg operation has been very successful and easy to control. Circulating loads have reached 600 percent. The air separators have air-cooling provision; and the cement as ground, when transferred through the stockhouse, is at a reasonable temperature at the time of shipping. It is anticipated that grinding of fine cements will be no problem when they are required.

In 1956 the new plant at Wood-

[4] See PIT AND QUARRY, August, 1956, p. 104 *et seq. Canada Cement Company Expands,* by A. S. Dies.

NEW! THE CAT* NO. 7G BULLDOZER



Blade tilts 3′ to either side!

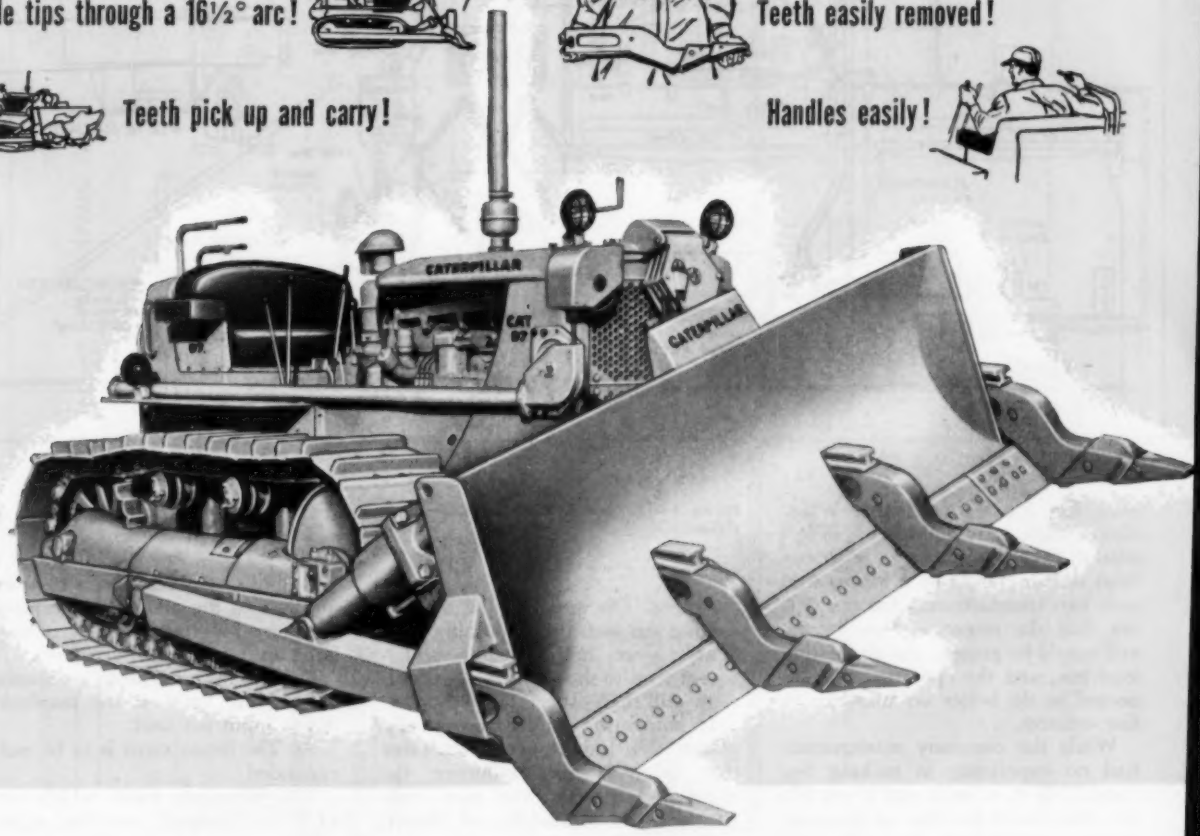
Teeth slice through hard materials!

Blade tips through a 16½° arc!

Teeth easily removed!

Teeth pick up and carry!

Handles easily!



'DOZER AND RIPPER IN ONE

The brand-new Caterpillar No. 7G Bulldozer is a completely different type of bulldozer. The amazing tilt-tip action, and its four heat-treated cast steel teeth, are an entirely new concept in 'dozing. The Gyrodozer is both a 'dozer and a ripper.

YOU'LL GET HIGHER PRODUCTION

The Gyrodozer rips through hard or frozen materials. Its 23″ teeth not only pry out boulders but pick 'em up and carry 'em away. In rocky soil, the wedging action of the teeth surfaces small rocks for scooping up by the 10′ 10″ blade. On the really tough jobs, the tractor's full horsepower can be put behind a single tooth. The Gyrodozer is ideal for uprooting trees and clearing an area in a hurry.

EASY TO OPERATE

A Cat No. 25 Cable Control raises and lowers the 'dozer and a front-mounted No. 44 double-valve Hydraulic Control tips and tilts the blade. The operator never needs to leave his seat to make a blade adjustment.

GET FULL DETAILS

on the revolutionary new Gyrodozer from your Caterpillar Dealer.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WANTED—
THE HARD WORK

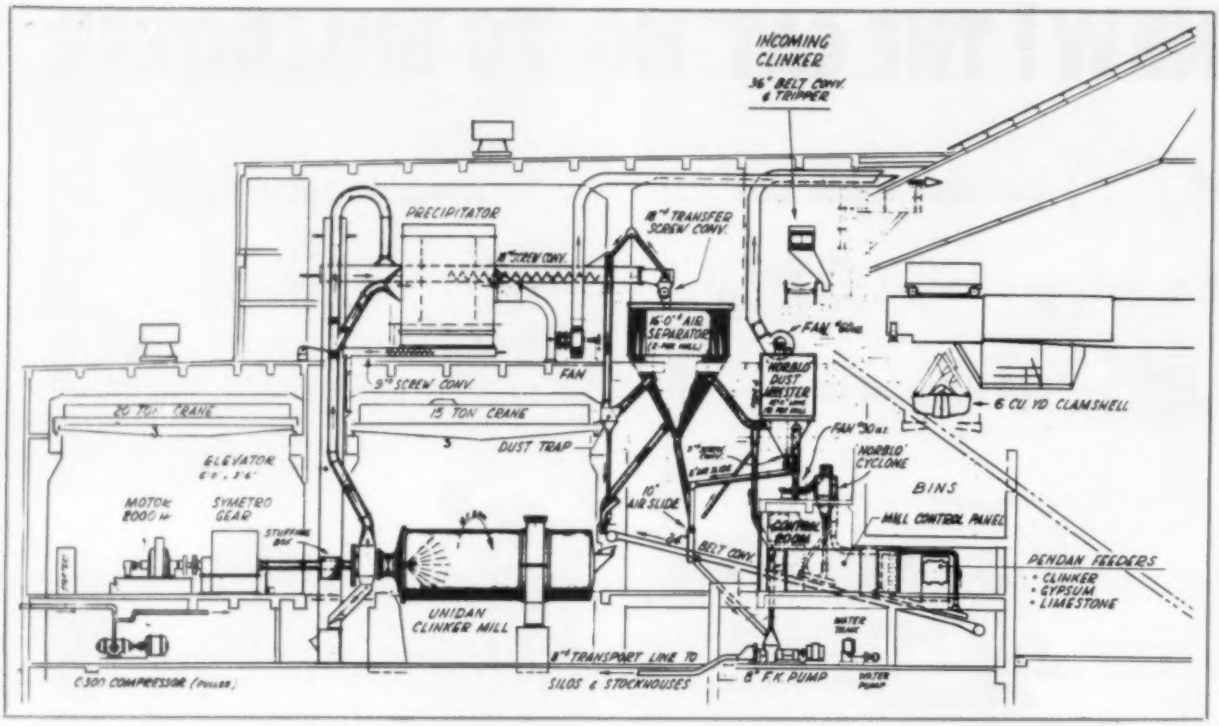


Figure 1—The new 2,000-hp. clinker mill installation.

stock, Ont.,[5] was constructed. When clinker mills were considered, it appeared that thinking was reversing from the short mill to a longer mill with two compartments for the reason that the retention time in the mill would be greater, the circulating load less; and the operation was expected to do better on masonry or fine cements.

While the company management had no experience in making fine cements in short mills and it was felt that this could be done on demand, the longer mills were chosen in order to get some experience in this type of grinding unit. In this case, F. L. Smidth Pendan feeders are used, supplying clinker and gypsum to three No. 2630 8-ft. 6-in. diameter by 30-ft. Unidan mills, 1,100 hp. motors, with Symetro drives. Each mill is in closed circuit, and since the circulating load is about 200 percent, only one 16-ft. Sturtevant separator was required per mill. These grind 160 bbl. per hour of Type I cement.

There has been no difficulty in obtaining fineness, strength, or other qualities of Type I, masonry or high-early-strength cements from this mill. The power consumption is about 6.7 b.hp. per barrel for mill only, and 7.0 kw. per barrel for the entire department. Operation at the time of writing was such that accurate power figures were not available which would tend to show this as a less efficient mill than others.

In comparing results from several plants, it is important to remember that many factors influence the grinding rate. Size and type, temperature and grindability of clinker, mill condition, and charge condition are some of the factors. Other than giving a very general comparison, the figures shown are not in themselves fully conclusive.

With this background, the design of the Montreal East clinker mill was undertaken. The following factors were considered:

1. The grinding rate should be such that there would be reserve capacity to enable accumulated clinker to be ground in summer months and simultaneously to be able to make variety cements.
2. That cement of different fineness could be made at the same time and to any desired specification.
3. The department should operate with the fewest number of men.
4. Grinding efficiency should be the highest practicable.
5. Maintenance should be low and easy to accomplish.
6. Consideration of pre-initial set and cooling of cement should be made.
7. Full consideration of power supply and the ability of the power company to provide for starting of large units on the power system.
8. The fewest reasonable number of grinding units or the maximum power input per unit.
9. The department is to be easily expanded.

The Winnipeg mills, which were 11 ft. in diameter, provided experience on this size of mill and up to 1,100 hp. input. In England a mill has been operating with 1,650 hp. for many years. Manufacturers and cement companies have given some consideration to mills as large as 2,500 hp., but none had been operated in excess of 1,500 in North America.

The first stage was to decide, in general, what size and power of mill would be considered. A study of the existing clinker mills showed that a factor of 6.9 b.hp. per barrel could be used for Type I cement, and for the final installation a minimum of eight 1,250 hp., seven 1,500 hp. or six 1,800 hp. mills would do the job. It was also proven that six 1,800 hp. mills would cost less than any other combination of less hp.

A consideration of mill drives was undertaken to determine the maximum size of mill that could be

[5] See PIT AND QUARRY, July, 1957, p. 72 *et seq. Canada Cement Company Builds 3,200,000-Bbl. Plant*, by Walter E. Trauffer.

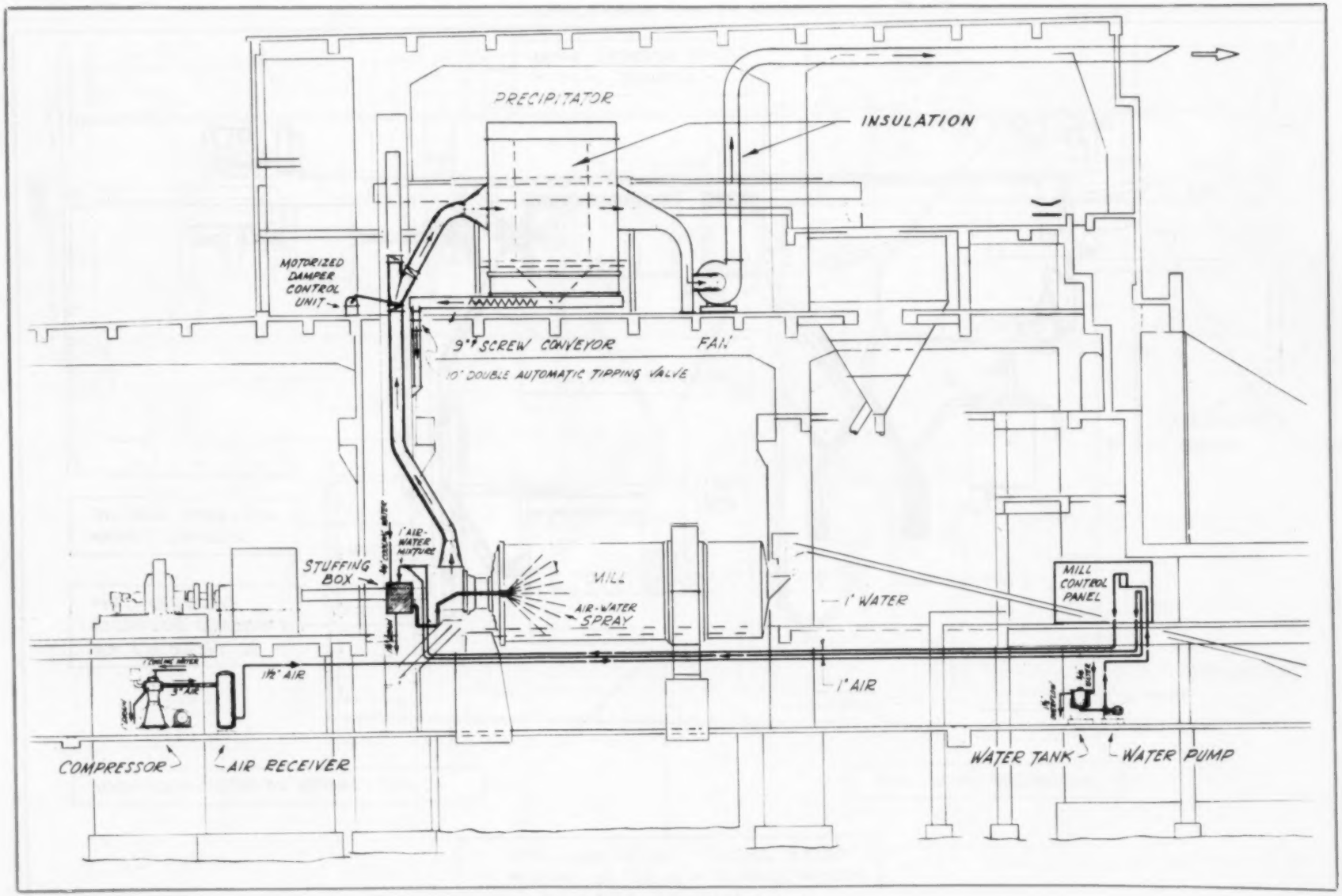


Figure 2—The internal water-cooling circuit.

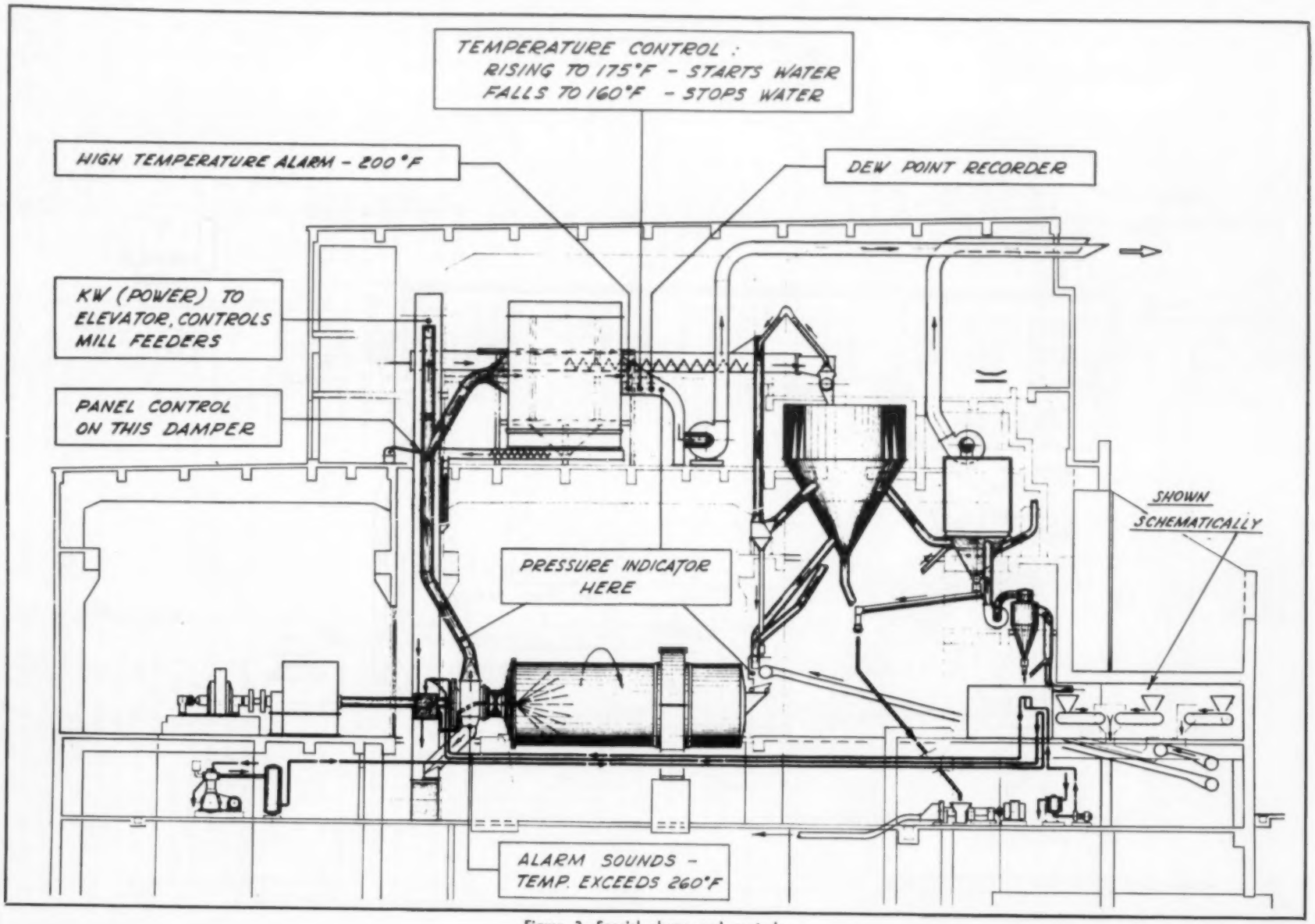

TEMPERATURE CONTROL :
RISING TO 175°F - STARTS WATER
FALLS TO 160°F - STOPS WATER
HIGH TEMPERATURE ALARM - 200°F
DEW POINT RECORDER
KW (POWER) TO ELEVATOR, CONTROLS MILL FEEDERS
PANEL CONTROL ON THIS DAMPER
SHOWN SCHEMATICALLY
PRESSURE INDICATOR HERE
ALARM SOUNDS - TEMP. EXCEEDS 260°F

Figure 3—Special alarms and controls.

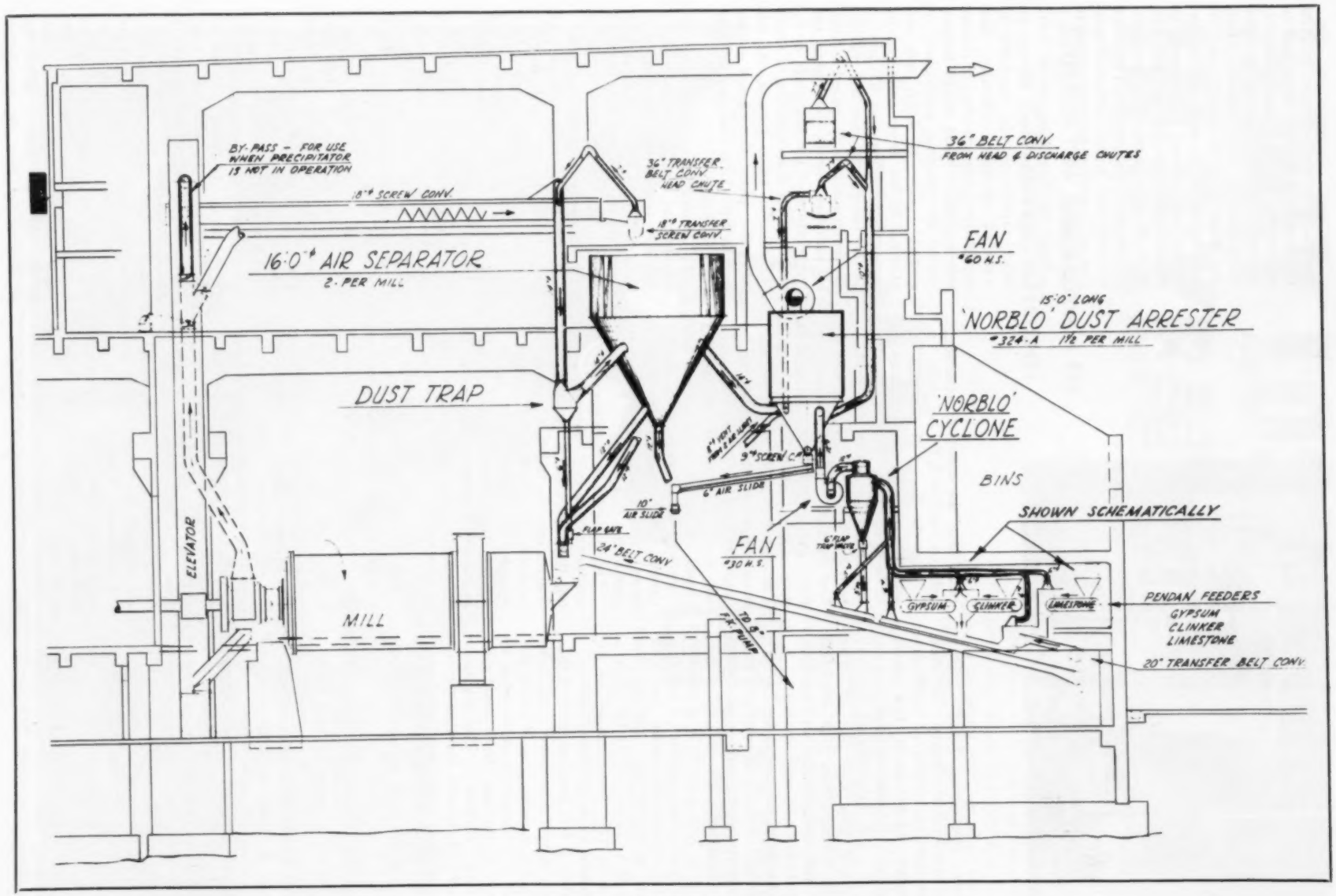
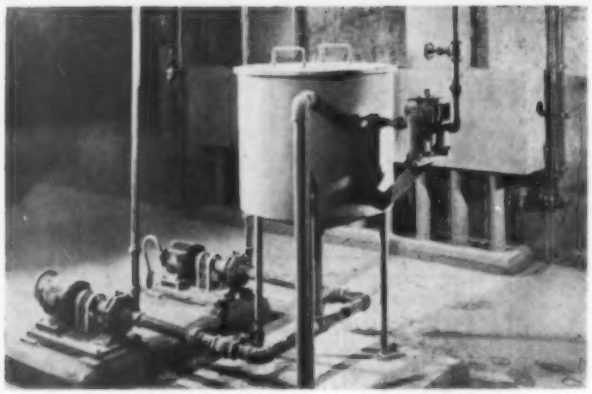


Figure 4—The dust-arresting circuit.



The water pumps, tanks, etc., for the spray cooling system inside one of the mills.

driven, considering today's experience and available designs. The company had in service 12 1,100 hp. Symetro drives, under full power loading, and experience had been excellent. The management felt very confident that this type of drive could, if designed for it, drive a 2,000 hp. mill successfully and reliably, with little or no maintenance.

This Symetro would be No. TS 1500 B, which had not yet been manufactured but which had been fully designed. This unit, of course, was gone into as carefully as possible. The stated rating of such a Symetro at the anticipated motor and mill speed is 2,150 hp., and by the A.G.M.A. rating 2,300 hp. with a factor of 1.5. These ratings are for 24 hours per day, full load service.

After it had been established that it was practical to drive a mill with 2,000 hp., a careful consideration was made of various mill proportions, to determine the one which would give optimum efficiency. The transport capacity of the mill and thus the circulating load to be anticipated were closely considered. Attention had to be given also to transportation clearances and methods.

The final design selected was to be 11 ft. in diameter and 30 ft. long, to operate at a speed of 18.0 r.p.m., corresponding to 76.5 percent of critical speed. With the anticipated charge, it would be filled to about 35 percent of mill volume. The transport capacity of the existing 11-ft. by 15-ft. 8-in. mill was known, and there was every reason to believe that this transport capacity could be repeated in the new F. L. Smidth mill if the lifter partition were properly designed. The mill would have two compartments, therefore, approximately 10 and 20 ft. long, with corresponding gradation of ball sizes. Circulating load could be expected to be about 200 percent. It is anticipated that the ultimate department will contain five 2,000 hp. mills.

Thus the design of the mill was settled upon, with the auxiliaries yet to be considered. The mill itself is supported on one slide shoe and one trunnion bearing. It is lined in the first compartment with forged steel liners and in the second compartment with a spiral wave Ni-Hard lining. The partition is of the lifter type, designed with careful attention to grate opening area, lifting capacity, and throat dimensions. At the discharge end of the mill is a grate and lifter type of discharge, similarly designed. The Symetro drive connects to an extension of the discharge trunnion of the mill.

The clinker is brought into the department by a belt conveyor at the top floor level. This conveyor discharges into the mill bins, which are so designed that they will overflow into the storage after they reach a certain level. (See Figure 1.) This arrangement permits the mill to be fed without using the overhead crane and, conversely, will make it possible to get along with one crane only.

One of the two mills was intended to grind any unusual cements during the year; and remaining available time was to be used to grind Type I. Feeders were therefore provided for clinker, gypsum, and a third component, if used. The units chosen were Smidth Pendans, which are suspended pivoted constant-weight feeders with metal pans, rather than rubber belt, for the conveying medium, operating on a variable speed principle. The two feeders (three, if making masonry cement is made) are synchronized electrically and in correct proportion, controlled from the mill control panel. The fed material discharges to a feed belt and thence to the mill.

The mill product passes by a chute to a 30-in. bucket elevator which discharges to screw conveyors carrying the flow to 16-ft. 0-in. Sturtevant air separators. The two separators were chosen to provide optimum operation when grinding finer cements. Oversize drops by chute directly into the feed hopper of the mill, and the fines or finished cement is conveyed by Fuller-Huron Airslide to the 8-in. Fuller-Kinyon pump. Due to capacities involved, one pump was provided for each mill; in fact, each mill operates as a complete grinding system in all respects.

From the beginning, every detail was given intense study because no other experience was available to warn of operation difficulty. The mechanical problems were, of course, surmountable. What would happen during the grinding, particularly as regards release of heat, was unknown. It has been estimated by students of milling that 95 percent of the energy put into the mill by the motor must be dissipated as heat, by radiation, or by increasing the temperature of the materials, or by heat used for decomposition of water of hydration from gypsum. At this particular plant the clinker comes directly from kilns and may at times reach 210 deg. F.

To overcome the problem of liberating heat, both air and water cooling were considered. Since the volumes of air to be handled were so great, the use of water was fully explored. Cooling of mill shells by external spray is untidy and inefficient, particularly with mills as large as 11 by 30 ft. In North America some attempt had been made to use water internally as a grinding aid and to cool the mills, but with indifferent success.

Injection of water inside mills by carefully controlled spray systems has been used very successfully in Europe for a number of years. Some of these plants were visited by the writer, who saw medium and long mills operating in both open and closed circuit, with internal water spray. Water volume as great as 1½ percent of the weight of finished cement ground was admitted in some cases. The most serious doubt in any one's mind is whether this can be done without the moisture being picked up by the cement, causing a loss in properties. No evidence was found in any plant that this was occurring, and the operators were very enthusiastic about it, both as to prevention of pre-initial set and as a grinding aid. Apparently, when water is injected at the correct point in the mill, the heat is picked up so successfully that the maximum

½ DAY LOST IN 8 YEARS

Since he switched to a "Jimmy" Diesel

Working up to 9 hours a day, 6 days a week, in Robert Bailey's strip mine near Morrisdale, Pa., this General Motors Detroit Diesel-powered shovel has had total down-time of only *one-half working day in 8 years' operation.* Because of the dependable service and economy of this "6-71" engine, Bailey swung to GM Detroit Diesel power—now operates 9 units on generators, in tractors and in another shovel.

Does it pay to standardize on GM Detroit Diesel power? It sure does. For it simplifies your servicing and parts requirements. And, with power at *every* piston downstroke, these fast-stepping 2-cycle Diesels get more work done at less cost on any job.

You can have GM Detroit Diesel power (single engines, 30 to 300 h.p.; multiple units, up to 893 h.p.) in over 1,485 different applications of power machinery. For the list, see your GM Detroit Diesel distributor or dealer—or write us direct.

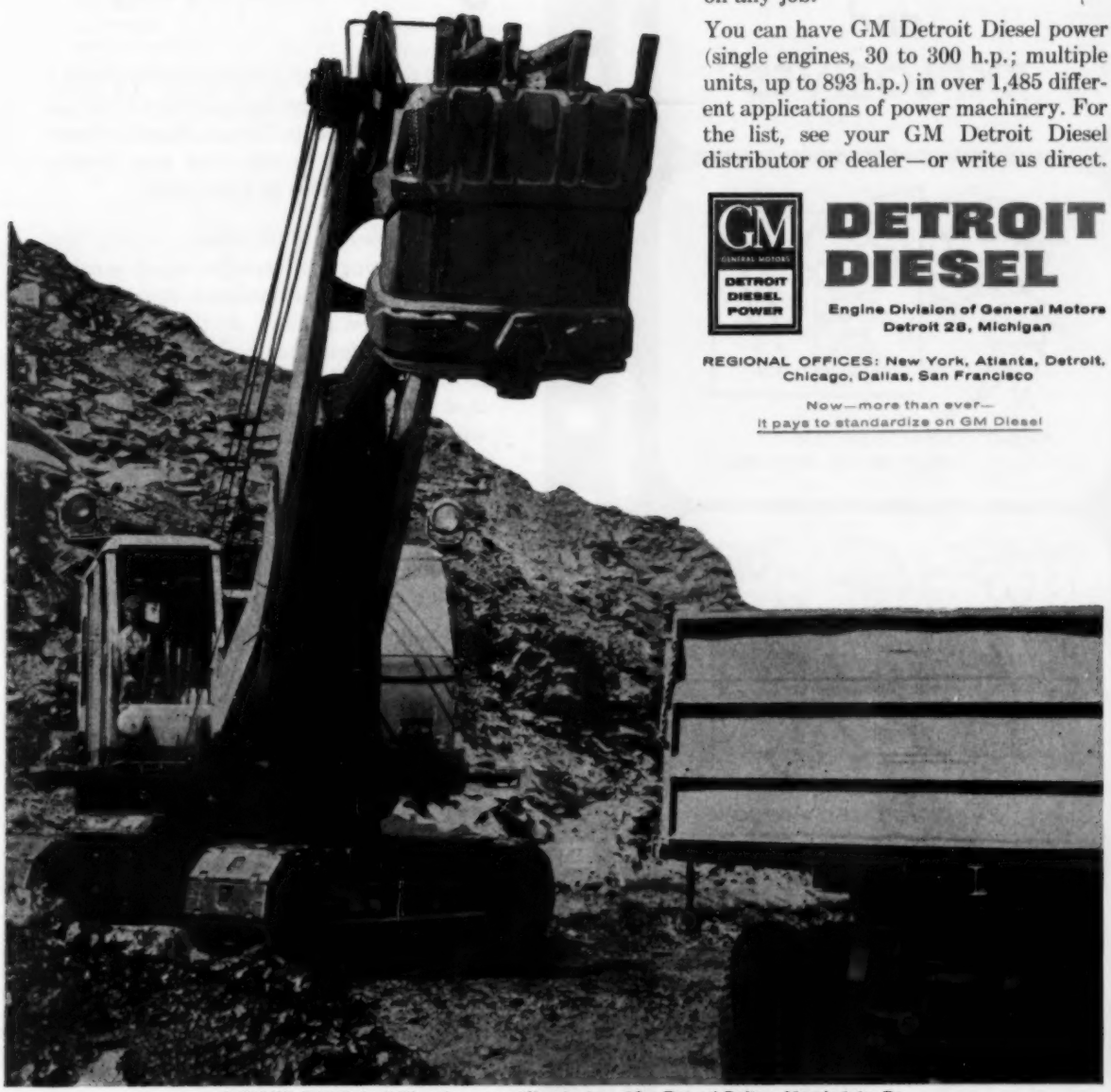
GM GENERAL MOTORS DETROIT DIESEL POWER

DETROIT DIESEL

Engine Division of General Motors
Detroit 28, Michigan

REGIONAL OFFICES: New York, Atlanta, Detroit, Chicago, Dallas, San Francisco

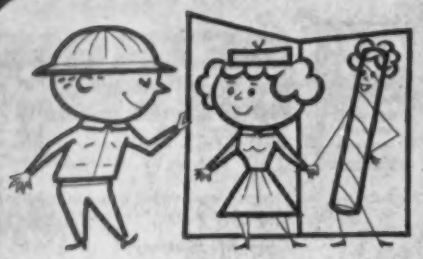
Now—more than ever—
it pays to standardize on GM Diesel



A GM "6-71" Detroit Diesel powers 1½-yd. shovel for Robert Bailey, Morrisdale, Pa.

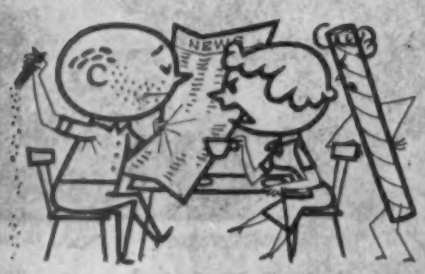
HERE'S A MOVIE FOR POWDER MEN ONLY

"How to handle WOMEN and EXPLOSIVES"



TREAT THEM GENTLY AND WITH RESPECT

PROTECT THEM FROM UNAUTHORIZED PERSONS



OBEY THE DO'S AND DON'TS

to help you blast with greater safety

You'll protect your safety record and gain a smoother, safer blasting operation if you use the new Atlas movie "*How to Handle Women and Explosives*" to help your men observe basic safe practices in their work.

You'll make a deep impression at your next safety meeting with this film which is calculated to bring out amused chuckles and possibly a few guffaws. At the same time it stresses the fact that both women and explosives must be "handled with care" and that both have a list of Do's and Don'ts which must be observed in order to get along with them safely.

Many large operations are using "*How to Handle Women and Explosives*" as a safety meeting kick-off and following with a discussion of the Do's and Don'ts case insert.

The film, complete with a suggested program kit and enough copies of the Do's and Don'ts for your audience, will be sent to you without cost if you write us on your company letterhead, giving the date or dates you plan to use it.

EXPLOSIVES DIVISION

ATLAS POWDER COMPANY

WILMINGTON 99, DELAWARE

offices in principal cities

temperature of charge and load inside the mill does not reach a dangerous level.

The scheme is to inject a controlled amount of water into the second or hottest compartment of the mill, where it will be evaporated immediately, withdrawing heat. Water is carried into the mill by compressed air through a simple nozzle which breaks up the water into small droplets. The nozzle is located a few inches inside the center grate of the discharge end. This mixture of air and super-heated steam is swept out of the mill through an electrostatic precipitator and discharged to atmosphere.

The precipitator, which is manufactured by F. L. Smidth & Co., was selected because of their experience on this particular application and because of its simplicity of design. It was designed to carry 7,500 c.f.m. of air, which has proven to be just about correct. The selenium rectifiers and all electrical equipment for it are housed in a ventilated room adjacent to the precipitator. The discharge electrodes are helical wires under tension; the collecting electrodes are simple formed-steel plates suspended on springs; and the rapping is done mechanically and is continuous.

This precipitator is provided with strip heaters on the lower casing which elevate the temperature of the shell prior to the starting of the mill. These are controlled manually at ⅓ or at full temperature. Other heaters are provided in the insulator pots, with thermostatic control. All ducts, precipitator casing, and fan casing from mill to atmosphere are insulated. The diagram of the system is shown in Figure 2.

The principle involved in water spray into the mills is very simple, but the details of how it is done are very important. For instance, since air pressure must be constant, a separate compressor is provided. The water pressure also must be constant; so a pump is provided for each mill to draw its water from a small tank filled by the float valve arrangement. Water injection must not be started until certain conditions are satisfactory and the interlock circuit is such that this is assured. The following are essential points:

1. The mill must be running.
2. The air compressor must be running.
3. The cement temperature at the mill discharge must have reached or exceeded 230 deg. F.
4. The air temperature at the discharge side of the precipitator must have reached 175 deg. F.

Mill No.	1	1
Date	Aug. 1/57	Sept. 12/57
Time	5:00 p.m.	3:00 a.m.
Clinker size	–3/8″	–1″
Clinker temperature	210° F	160° F
Cement temperature, mill discharge	250° F	208° F
Cement temperature, #1 Separator discharge	185° F	175° F
Cement temperature, #2 Separator discharge	140° F	143° F
Dew point in precipitator	106° F	112° F
Precipitator temperature	236° F	224° F
Water rate	2.4 g.p.m.	nil
Air-water pressure	27 p.s.i.	nil
Mill motor kw.ψ	1500	1450
Mill motor b.hp.	1809	1825
Mill Rate Indicatedφ	55 t.p.h. xφ 313 bbl. per hr.	55 313

NOTES:
ψCharge was just brought up and has not "settled in" yet.
φThese are direct readings from the panel and do not have any correction factor for the feeders applied to them.
xFeeders rate by test 330 bbl. per hour.

When these conditions are satisfactory, the water can be put on either manually or automatically; or if any one of these fails, the water pump will stop. To date the plan has been to adjust the amount of water, which must be done manually, to control the cement temperature at the mill discharge to 250 deg. F. A dew point recorder at the discharge of the precipitator has been provided to forecast operating troubles. It has proven that the dew point has not come dangerously close to the actual temperature at which condensation would occur. The controls and alarms are illustrated in Figure 3.

Dust collection is accomplished by the use of Norblo bag-type collectors at the feed end of the mill and precipitators for the discharge ends. Dust-laden air from the feeders passes through a scalping cyclone and a booster fan before entering the Norblo. Dust from the conveying system on the upper floor passes through the air separators to the Norblo and effects a certain amount of air cooling. This is shown on the diagram in Figure 4.

The starting, stopping, and control of all equipment (with one or two slight exceptions) is done by the miller in the control room, in which the two control panels are located. (Ultimately there will be a third.) For test purposes, each motor can be run by itself from a control station near the motor. This control room is located on the catwalk level; here the miller can walk directly to the mill feeders or to the motor room without climbing stairs. This totally enclosed room is provided with clean ventilated air from outside to exclude any small amount of dust which might possibly enter. In this room also, attached to the table, is a console of Fuller-Kinyon transport line remote valve controls, and within easy vision an alluminated flow diagram of the pipelines. These are all visible in one of the accompanying illustrations.

Each mill panel contains a complete set of instruments for its own mill. The flow diagram, prominently located on it, has lights which show that equipment is running. Pistol grip switches for starting and stopping each machine, recording instruments, and indicating meters, provide important information.

Several notable features are worthy of comment. The right-hand section of each panel shown in the photograph is for the feeders. The prominent quadrant meter indicates the feed rate in t.p.h. An automatic feed controller between the two circular charts meters takes the power input to the bucket elevator as the control point, and causes the Pendan feeders as a group to increase or decrease feeding rate to hold the amount of material going up the elevator at a selected level. Mill production is computed from readings on counters which are also located on the control panel.

The circular charts are for cement temperatures and for the dew point at the discharge side of the precipitator. The left-hand narrow section of the panel contains pressure gauges for air, water, and air-water mixture for the water spray system. Control valves adjust the system, and the Rotameter indicates the water flow rate. Water has been added to these mills up to the rate of 4.0 U. S. g.p.m.

Some actual recorded readings from the daily log sheets are shown in the accompanying table to illustrate typical operation.

The motors and Symetros are located in a sealed room, together with unit substations, starters, mill spotting controls, MG sets, and the like. Air is swept through this room

(*Continued on page* 100)

Counter-Cyclone Unit Designed To Produce Clinker in Minutes

By J. C. WITT,
Consulting Engineer, Chicago

PORTLAND cement clinker has been produced from commercial raw mix in several minutes, approximately 1/60 of the time required for the same raw mix in a rotary kiln, and cement ground from this clinker passed A.S.T.M. specifications. The only departure from current practice was in the design and operation of the clinkering equipment. The pilot plant was entirely practicable, and with an increase in size it could have been employed commercially.

The development of the new unit, which has been named the Counter-Cyclone Clinkerer, came about from the study, analysis, and correlation of information obtained from observation, plant operation, experimental engineering, and research.

Two questions suggested careful consideration: (1) In a rotary kiln, why is so much time required for the conversion of raw mix into clinker? (2) Why is the thermal efficiency of a rotary so very low? The same general principles are applicable to both dry-process and wet-process kilns, but for simplicity we shall consider here only the dry process.

Study of these two questions suggested their probable relation. As the mixture of raw materials proceeds through the kiln, a series of changes precedes the synthesis of clinker minerals. These changes include the evaporation of any moisture present, the oxidation of any organic matter, sometimes other examples of oxidation and reduction, and calcination of calcium carbonate. Each chemical or physical change requires the application of heat to particles of raw materials. This is true also of the heat required to bring about the synthesis reactions, some of which in themselves are exothermic.

In general, at a given instant, the top layer of particles receives heat directly from the flame and the combustion gases; and the bottom layer receives heat from the kiln lining. Each particle between these two layers receives heat only from an adjacent particle, with which it may be in incomplete contact. Of course, these statements do not apply to the particles comprising the spill from the side to the bottom of the kiln.

The next instant some other particles assume positions in the top layer or in the bottom layer, while others enter the interior of the system. In this way the heating of the particles is intermittent, and probably some of them never receive heat directly from the flame nor from the combustion gases. Referring to the preliminary changes, the water vapor and carbon dioxide released must find their way to the stream of combustion gases approaching the kiln exit, and the labyrinths of passage ways offer much resistance.

If particles of raw materials could be heated directly and continuously, it seemed likely that clinker could be produced in a brief period of time. A unit that would bring this about would also facilitate the removal of moisture, carbon dioxide, and any other by-products that might be present.

At first, consideration was given to the burning of pulverized coal blended with raw mix. However, one serious disadvantage existed. The presence of the particles of raw materials and the carbon dioxide resulting from calcination and combustion would tend to retard the burning of the coal. Furthermore, it was desirable to design a unit that could be fired by any fuel commonly used in cement manufacture, rather than one restricted to pulverized coal.

The first pilot installation consisted of four horizontal tubes discharging into a vertical chamber. Alternate tubes carried burning fuel, and raw materials in a current of air. The burning fuel entered the chamber cyclonically, and the raw mix entered counter-cyclonically. In this way, all the particles of raw materials were exposed to direct heat.

From the first, encouraging results were obtained. However, the clinker was unsound because it contained excessively high percentages of uncombined calcium oxide, and it did not develop sufficient strength. Evidently the heating of the raw materials particles for such a short time—probably a few seconds — was not sufficient. Study of the data and general information obtained from the first installation led to the design of the second pilot installation.

The basic principle of the second installation was the same as that of the first. The only important change was that the period of heat application was appreciably lengthened. The raw mix was introduced at the top of a vertical central chamber, which was much longer than that of the first installation. The burning fuel was introduced through a series of ports extending from top to bottom. Down draft was provided. By the time the raw materials reached the bottom of the central chamber, they had been converted into clinker. After a series of runs and adjustments, sound clinker passing A.S.T.M. requirements was produced. The time required did not exceed several minutes.

At this writing, the thermal efficiency has not been determined, but the indications are that it is much higher than that of the rotary kiln. As in the rotary, fuel conservations procedures may be applied to the clinkerer. These include insulation, preheating all entering air solids, and recovering heat from the clinker and from the exit gases.

After the clinkerer had been developed, a study of the unit and its operation revealed a number of merits that had not been taken into account at the beginning. Here is a partial list.

The whole unit is much simpler than the rotary kiln. There are no heavy moving parts. In fact, the only moving parts of the entire unit consist of such items as conveyors

(Continued on page 136)

SECO HELPING MAKE *Cushions* for *Superhighways*

Photographed on the job at Gary Slag Corp., Gary, Ind.

at Gary Slag Corp., Gary, Ind.

Indiana's giant, modern roadbuilding program is in full swing and Gary Slag Corporation is taking an active part in it.

For instance, Gary Slag has met the strict specs. of the new Indiana East West Toll Road in supplying the sub-base cushion for ten miles of this road. In addition, they have supplied concrete aggregate for twenty miles of the same road and they have furnished a large amount of macadam paving material. Ten SECO screens are taking an important part in this operation, too! Gary Slag Corporation estimates that they have screened and sized over 7 million tons of specification material over SECO screens since 1947.

In the words of Mr. P. J. Mack, General Supt. of Gary Slag Corporation "We can't praise our SECO screens enough for dependability, accurate sizing and minimum down time. They take tremendous loads without a whimper."

SECO scalper screens 400 T. P. H.

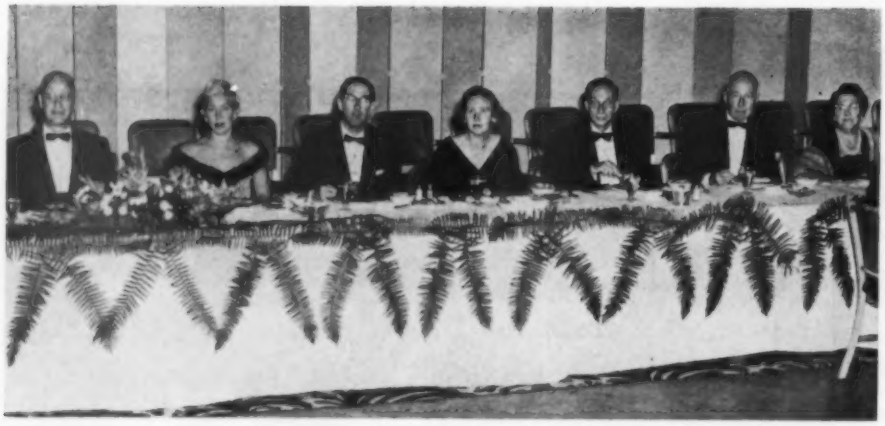
Seco screen in tower of Gary's lightweight aggregate plant

Outgoing materials to meet toughest specifications

SEND FOR SECO CATALOG #204

SCREEN EQUIPMENT COMPANY, INC.

Buffalo 25, New York



At the head table at the banquet were Emery M. Durstine, president (Keener Sand and Clay Co.); Mrs. George W. Cannon Jr.; William J. Cannon, vice-president (Nugent Sand Co.); Mr. and Mrs. Sterling N. Farmer (Sand Products Corp.); and Mr. and Mrs. Clarence R. Wolf (New Jersey Silica Sand Co.).

N.I.S.A. Convention

Features Important Committee Meetings and Reports

The semi-annual meeting of the National Industrial Sand Association at the Greenbrier, White Sulphur Springs, W. Va., October 15-18, 1957, drew an excellent attendance from member companies. The program, concentrating on several important past developments and expected problems, was interesting and well presented. Its format, patterned on a tentative plan tried out a year ago, had the various committees meeting on October 16 and 17. All members were free to attend any meeting of their choice and to participate freely in the discussions. The reports of these committees were presented for further discussion and action on October 18, at which time the executive session of the members was also held. The board of directors met the afternoon of October 15.

By WALTER E. TRAUFFER

Labor The year 1957 was one of comparative labor peace in this industry, according to Ralph S. Lebold, chairman of the Advisory Committee on Labor. There were no major strikes, as few contracts terminated during the year. The year 1958, however, poses problems, and producers should be prepared for annual labor demands, including increased wages, expansion of fringe benefits and pension plans, etc. He advised a positive approach to these problems on the part of producers and pointed out the advantage of making their own proposals. Better employee relations can be fostered said Mr. Lebold, by (1) giving employees a better understanding of their jobs and the company; (2) improving working conditions; and (3) installing an employee suggestion system. He also suggested that the association revise its surveys on labor, costs, etc., and clarify their use.

Health In his report as chairman of the Advisory Committee on Health, Earle T. Andrews concentrated on the seminar on dust control held by the Industrial Hygiene Foundation in Pittsburgh, Pa., June 17-19. The quality of the program at this and the two previous seminars has been high, he said, but the attendance has been disappointing. Various ways of popularizing them were discussed. Important subjects proposed for further study include the following:

1. What is silicosis?
2. A proper medical program.
3. What are the fundamentals of good engineering design and equipment for dust collection?
4. Dust count method for control.

Traffic The report of the Traffic Committee was presented by William J. Woods Jr., chairman, and Henry M. Wick Jr., traffic counsel for the association. The present freight car surplus is expected to decrease as shipments increase. The cars owned by the railroads went up over 30,000 in the last year, but new car orders are dropping. Mr. Woods urged producers to sell the railroads on the necessity of continued orders and also of keeping up their car repair programs. The railroads are hoping for the repeal of federal transportation excise taxes, and producers should help by contacting their congressmen.

Mr. Wick also mentioned Senate Bill 2906, which asks the Railroad Equipment Administration to buy locomotives and cars and lease them to the railroads. It is claimed that this plan would solve the railroads' problems and cost the government nothing. According to the proponents of this plan, the railroads could then concentrate their expenditures

on improved service, etc., and there would be no need for rate increases.

The eastern railroads, according to Mr. Woods, are conducting a comprehensive research program, and those in the Middle West will do the same. They will analyze the entire traffic problem, including trucking, water transportation, etc. The association, he said, will ask this group to study silica sand rates as any further increase in them will affect the tonnage shipped by rail. The railroads recently explored the possibility of a further general rate increase and may give special study to captive tonnages instead.

Mr. Wick reviewed ExParte 206, which increased the freight rates in varying degrees in different areas, including the emergency 7 percent increase granted last December. The railroads used the argument that they needed a greater return. The ICC rejected this as a reason but gave them an increase, stating also that any future increases depend on increased costs. Mr. Wick pointed out that since 1946 sand and gravel rates have increased 99.6 percent, more than those for coal, iron ore, etc. He also said that the railroads have never taken the full increases granted on all commodities, but only on some while holding others down.

In closing, Mr. Wick said that the association must show that industrial sand is not a captive commodity and that the railroads can lose business to trucks, nearer sources of supply, etc. He recommended that the association, as in the past, oppose any further rate increase and provide the evidence to support its stand.

Taxation Arthur F. Harrison, chairman of the Committee on Taxation, gave his report, as did John T. Sapienza, tax counsel for the association. According to Mr. Harrison, the House Ways and Means Committee on January 7 will start studying the tax laws, especially percentage depletion. The Committee feels that the association should be prepared to protect its position, and it was voted to take all necessary steps to do so. This includes filing a statement defending the depletion allowance of this industry before January 7.

According to Mr. Sapienza percentage depletion is a very controversial subject, and the congressional hearings beginning in January will re-evaluate the entire tax structure, including the treatment of natural resources. Possible actions by Congress may include: a review and general lowering of depletion rates; definition of cutoff points; and cutting the allowable percentage of net from the present 50 percent to 33⅓ percent as in Canada. Mr. Sapienza reviewed the recent Supreme Court decisions favoring industry and predicted that the Treasury Department would drop the many pending cases as a result.

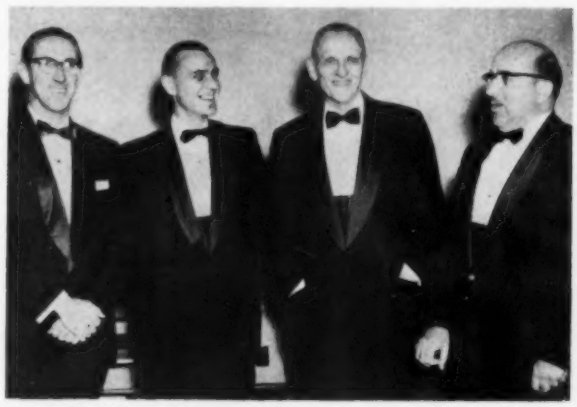
He then reviewed other tax developments, emphasizing that sentiment in Congress is now against tax reductions. However, tax rates may be changed to favor small business. Repairs, maintenance, and depreciation are now being watched as are also entertainment, convention expense, gifts, etc. Old regulations on depreciation allowances did not stress salvage values, and for a time many companies were able to sell fully-depreciated equipment at good prices, listing this as capital gain. The government, he said, is now setting up a high salvage value and this must be set up when the asset is acquired.

Fineness and Grading The report of the Committee on Fineness and Grading of Foundry Sands was presented by William D. Chadwick, chairman. He referred to the first joint meeting of the committee with this committee of A.F.S. on April 18, 1957, and the second one on September 6. The discussion was devoted largely to the most important problem, that of segregation. As a result, the committee recommends an educational program to insure that consumers recognize the importance and occurrence of segregation. Sands from various sources have minor differences but all have the same segregation problems. The committee also recommended getting users to accept plant tests on all shipments as they can be more accurately sampled then than on arrival at destination. In closing, Mr. Chadwick said that any silica sand producers wanting to attend the sand and gravel heavy machinery show in Chicago from February 10 to 14 can get badges free of charge.

Public Relations The report of Karl O. Geng, chairman of the new Committee on Public Relations, outlined this group's interesting discussions at its first meeting on October 17 on the various aspects of a problem new to this industry: the growing demands for stronger zoning laws and regulations being felt everywhere in this country by natural resources industries. Each member of the committee reported on the problems his company had encountered, the solution of most depending principally on good community or public relations. Producers in the eastern states particularly are encountering this problem more than in other areas as these states are more thickly settled. One eastern producer actually had to suspend operations at one property.

Mr. Geng warned producers that as zoning boards and new zoning laws come into being, the fact that a nonconforming use of the land was in existence prior to the law does not guarantee the privilege of continuing the nonconformity. In many instances also performance standards are established, such as controlling dust and noise, which are difficult, if not impossible, to meet. Other standards specify that the nonconformity cannot be enlarged, which in some cases means that an open pin cannot be developed beyond its present actual size. Also, he pointed out, it is legal for a zoning board to set a number of years for the nonconforming user to conform to the zoning law which, of course, sets a time limit on the operations affected.

A new theory which perhaps should be developed, said Mr. Geng, is that of using a piece of property only for the purpose for which it is zoned, in other words, eliminating the theory of upgrading. A piece of property zoned for industry, therefore, could not be used for housing. He also mentioned that the National



In this group were William J. Cannon; Kenneth E. Tobin Jr., associate executive-secretary, and Vincent P. Ahearn, executive - secretary, N.I.S.A.; and Ralph Lebold (Michigan Silica Co.).

Sand and Gravel Association will soon publish a handbook on zoning.

The condemnation of land by highway commissions is a problem which has come to some producers because of the new superhighway program. There seems to be no answer at present as such a commission is able arbitrarily to lay out the route of a highway, and the only solution for the producer is to settle financially as advantageously as possible, preferably out of court. It was suggested that efforts be made to sell the theory that land should be devoted to its highest use. Many other problems were briefly discussed, with suggestions that the committee study possible solutions. Mr. Geng closed his report by urging that good public relations should start before one has trouble, rather than after.

Ahearn's Address The final feature of this meeting was one looked forward to by all in attendance, a discussion of the Washington scene by Vincent P. Ahearn, executive secretary. He feels that the work of the McClellan Committee will have great influence on future events connected with labor unions. Its chief interest is the welfare of the individual employee; and not only unions but also employers guilty of unfair practices will be exposed. This committee's problem, Mr. Ahearn said, is how much democracy will help the individual, rather than the employer. The committee may or will deal with the following: (1) misuse of pension and welfare funds; (2) misuse of union funds; (3) trusteeship defaults; (4) violence and terror—the unions are now allowed to do this, but not for long; (5) the indiscriminate use of boycotts; and (6) the use of dues for political purposes.

According to Mr. Ahearn, local police powers should be expanded if violence by unions is to be stopped. Once local police are told that there is to be no violence, there will be no need for federal or state interference.

On the Little Rock case, Mr. Ahearn stated that for 61 years the Supreme Court has upheld the doctrine of seperate but equal facilities. There had been up to this case, gradual acceptance in the South of eventual integration. Trouble is only starting, and the next session of Congress will be interesting. With respect to the intercontinental missile, it was pointed out that Sputnik hurt the pride of United States citizens. Our problem is to eliminate the war between our Army, Navy, and Air Force, which he believes was the main reason we were beaten on this matter.

One of our chief problems, according to Mr. Ahearn, is the perversion of the term politician from its original meaning, and competent people shy away from public life as a result. In Russia public life is the goal of every person; here we discourage public careers.

Another big problem is our population, which is increasing by 3 million per year, due more to prolongation of life than to increasing births. By 1967 our population will reach 200 million, and by 1975 it will be 230 million, with a high percentage of young and old. This growth is, he said, in a way a threat to the industrial sand and other industries due to the growing shortage of land in this country.

Business Session The convention was concluded with an executive session of the members at which the Shepard retirement program for member companies was explained by Kenneth E. Tobin, associate executive secretary. This same program, also adopted by N.S.G.A., provides optional plans to meet any company's needs. An advantage of this plan is that it pools administrative costs at a saving for all participants. The Shepard firm is an independant insurance broker with offices in Boston, Chicago, Jacksonville, Oklahoma City, Cleveland, and Los Angeles.

Canada Cement Co.

(*From page* 95)

by fans located below the motor floor. The air passes up through the motor and out through roof ventilators.

The design of the 2,000 hp., 514 r.p.m. 4,160-volt Canadian General Electric synchronous motor was very critical. At the outset the power company was contacted, to be sure that it could supply the inrush of current necessary to start these motors and that its system would not be unduly disturbed by either the starting or stopping of a motor. The motor is a heavy-duty self-starting synchronous unit using a saturable reactor starter. By this means the starting torque and inrush current was controlled, and the development of the torque in the acceleration period was also held to the permissible amounts allowed by the power supply system and the Symetro drive.

As is the practice when starting mills driven by Symetros, the charge is put into the mill in stages to permit the gear teeth to be worked in. The motor was carefully tested at each of these starting times and proved to fulfill the specifications completely.

The mill motors, being so large, warranted considerable attention to protective devices, and the following items were provided for it:

1. *Excitation voltage check*—to ensure that the exciter is on and that the excitation voltage has built up to normal.
2. *Residual ground relay*—to trip the motor off the line in case any ground faults occur.
3. *Lightning arrestors and capacitors* at motor terminals to protect against incoming line surges due to lightning or Hydro switching.
4. *Temperature detectors*—to protect the motor winding from overheating.
5. *Bearing temperature relays*—to protect the motor bearings from overheating.
6. *Incomplete sequence relay*—to trip the motor off the line if it fails to start properly and synchronize properly within a given time.

Concurrent with the installation of this mill department, the incoming power system of the plant was renovated. The power supply, therefore, is at 13,000 volts by underground cable, directly from the main substation. Two 7,500 kv.-a. transformers installed at the mill building will be adequate for a six-mill department. It was necessary to put the two transformers in because of starting requirements of the mills. Located in the motor room are unit substations, one per mill circuit, to provide 550 volt power for all auxiliaries.

Whereas we have provided equipment balanced with 2,000 hp. mill motor, it was felt that it would be advisable to operate these motors at 1,800 b.hp. for some time until the Symetro gears, mill bearings, motors—in fact, all equipment—was worked in and some operating knowledge was obtained from it. In other words, it would be brought up in stages. The present charges is:

1st compartment.	30,000 lb.	3-in. balls
	29,000	2½
	26,500	2
	12,500	1½
	98,000	
2nd compartment	35,000 lb.	1-in.
	132,000	¾
	167,000 lb.	
Total	265,000 lb.	

After a few months' run and after a complete mechanical inspection, it is the intention to bring these mills up to full 2,000 hp. At the time of writing, the actual b.hp. output of the mill motor is 1,825 and the mill

(*Continued on page* 136)

SAVES ENGINES!

Use Sinclair SUPER TENOL® to save your Diesels from the harmful and costly effects of *severe* operating conditions. Sinclair SUPER TENOL is specially engineered for the tougher jobs! It saves engines by combating the effects of high temperature, over-loading, and continuous stop-and-go service. It helps eliminate deposits of varnish, carbon and sludge that impair engine efficiency. Experience shows that Sinclair SUPER TENOL keeps equipment on the job longer . . . with less wear and fewer repairs!

Refill now with Sinclair SUPER TENOL. Contact your local Sinclair Representative or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N.Y. *There's no obligation.*

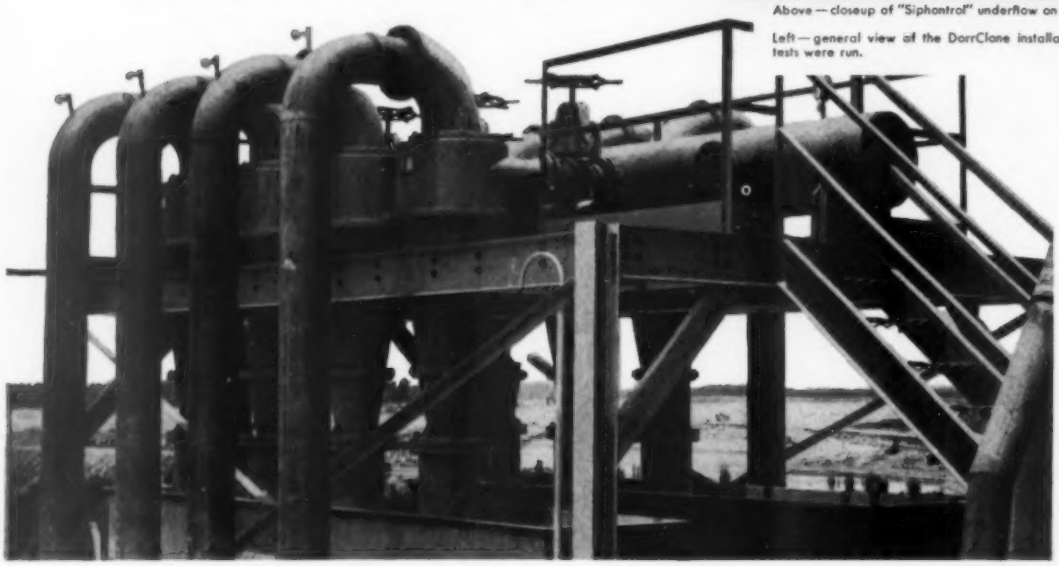
SINCLAIR SUPER TENOL MOTOR OIL

NOW... Automatic Control of DorrClone Classifier Operation...

Without Instrumentation!

Above — closeup of "Siphontrol" underflow on one unit.

Left — general view of the DorrClone installation on which tests were run.



Latest development in wet cyclone classifiers is an automatic control arrangement that does not require instrumentation. Named the "Siphontrol" underflow control, this new device maintains a reasonably constant underflow density from varying feed solids. Basically it consists of a tail piece extending below the apex valve of the cyclone discharging into a "Saucer" clamped on to this tail piece. The overflow pipe discharge is also submerged using either a saucer device or manifold.

Here are some typical operating results from DorrClone Classifiers in the field equipped with Saucer controls. These units are desliming phosphate rock at one of the mines in the Florida Pebble Phosphate Field. Successive tests were made at five-day intervals. Note the uniformity of separation despite the wide variation in feed composition.

Equipment — Seven 24" dia. DorrClone Classifiers **Control** — "Saucer" Underflow Density Controller

Test No.	1			2			3			4		
	Feed	O'flow	U'flow	Feed	O'flow	U'flow	Feed	O'flow	U'flow	Feed	O'flow	U'flow
Total TPH Solids	601.2	463.4	143.9	325.7	212.1	136.7	302.7	160.4	122.6	785.3	648.7	165.0
TPH + 150 mesh	442.9	449.0	13.5	204.2	202.3	7.0	211.6	148.4	8.0	624.9	615.7	21.5
TPH — 150 mesh	158.3	144.0	130.4	121.5	9.8	129.7	91.1	12.0	114.6	160.4	33.0	143.5
Efficiency												
+150 mesh recovered		97.1%			96.7%			94.9%			96.6%	
—150 mesh eliminated		90.1%			93.0%			90.5%			81.3%	

Tonnages are timed samples and are well within accuracy of method of measurement.

For more information on this new development in wet cyclone techniques, write Dorr-Oliver Inc., Stamford, Connecticut

DORR-OLIVER
INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U.S.A.

DorrClone and Siphontrol are trade marks of Dorr-Oliver Inc.

industrial minerals featured in

Meeting of Mining Society With S.E. Mining Conference

THE first annual meeting of the Society of Mining Engineers of the American Institute of Mining, Metallurgical, and Petroleum Engineers, held in conjunction with the Southeastern States Mining Conference, took place from October 15 to 18 at Tampa, Fla. Sessions were held in the hotels Hillsboro and Tampa Terrace, and a program of some 60 technological papers was presented by a number of the profession's most eminent members. The Florida section of A.I.M.E. and the Mining Society were co-sponsors of the meeting.

Technical sessions, scheduled through the first two days of the program covered several fields of discussion, including industrial minerals, minerals beneficiation, mineral economics, mining, and geology and physics. Two days of field trips were also scheduled for visits to several plants and mines in the area. Operations toured included the Noralyn mine and flotation plant of International Minerals and Chemical Corporation, the triple superphosphate plant of Davison Chemical Company, American Agricultural Chemical Company's phosphorous furnace installation, the Lehigh Portland Cement plant in Bunnell, and, at Brooksville, the Diamond Hill mine of Florida Rock Products, Inc.

In addition to the technical papers, a number of addresses devoted to vital economic considerations were delivered by representatives of both industry management and Federal Government officials. The outstanding luncheon speakers were the Hon. Spessard L. Holland, senior U. S. senator from Florida; and Marling Ankeny, director, U. S. Bureau of Mines.

The Application of the Fluidized Solids Process to Drying, discussed by William Brandt, Dorr-Oliver, Inc., covered the progress to date in the fluidized drying of granular solids in the metallurgical and nonmetallics industries. Also given was a brief description of the theory of fluidization, as well as a historical resume of the development of the process in non-catalytic fields by Dorr-Oliver, Inc.

A summary was presented of operating results from commercial fluidized dryer installations handling such various materials as dolomite and limestone, blast-furnace slag, and fine coal. The installations reported on included those at the New England Lime Company plants at Canaan, Conn., and Adams, Mass. (see PIT AND QUARRY, May, 1956 p. 122); the Marquette Cement Manufacturing Company, Rockmart, Ga.; the Lynnville Coal Company, Lynnville, Ind.; and others.

J. E. Castle, manager, Industrial Minerals Division, International Minerals & Chemical Corp., spoke on the critical factors involved in the evaluation of a potential mineral development.

A new application—the drying of a chlorinate hydrate—was also briefly discussed, with particular reference to design considerations required by the highly corrosive nature of the material.

On *Heat Exchangers in Connection with Rotary Kilns*, a paper prepared by R. W. Reedy, Maurice Shafer, E. N. Kunkle, and G. Niemitz of Kennedy-Van Saun, Mr. Reedy pointed out that increased thermal efficiency of rotary kilns has been of vital interest to industries utilizing this equipment for many years.

In a description of some of the various methods of heat recovery that have been developed over a period of years, it was indicated that there are two obvious sources of heat leaving a kiln from which it may be expected that heat units can be recovered. These are the calcined material itself, and the exit gases going to the stack. An additional area of thermal saving is within the kiln, and it may be accomplished by effecting better transfer of heat from the gases passing through the kiln to the material being processed.

Economic Evaluation of an Industrial Mineral Project is mandatory prior to investment in a new indus-

trial mineral development, it was emphasized by J. E. Castle, Chicago. manager of the Industrial Minerals Division, International Minerals & Chemical Corporation.

Rigorous economic analyses of such factors as supply and demand, technology, taxes, fluctuating prices, etc., must be made. Equally essential, the speaker cautioned, are accurate market surveys since inadequate studies in these areas are probably the most likely reason for failure in any industrial mineral project undertaken.

Pointing out that there are no specially favorable economic laws enhancing the industrial minerals industry, Mr. Castle called attention to the higher risks that all mining enterprises face, as compared to general manufacturing companies.

In amplifying the necessary steps toward making a sound economic evaluation of a new mineral project, the speaker stated that when an intensive market survey is at hand, production costs must then be considered. The next important steps, he noted, are the calculation of capital requirements, both working and fixed; the estimation of manufacturing costs; and the calculation of expected profits. From the assembled data, a breakdown chart may be constructed.

The Theory of Screening and Screen Selection Fundamentals was discussed by H. F. Ritmeester Jr., Hewitt-Robins, Inc. The paper dealt with the theory as it relates to vibrating screens, and covered the basic processes of stratification and separation, influence of the rate of feed, width of screen, rate of travel, and stroke characteristics.

Selection of screen size was considered in terms of the overflow method, the through-flow method, and the total feed method. Required width and area were also treated. Among the more important factors involved in screen type selection pinpointed by the speaker were headroom requirements, construction for simplicity or ruggedness, efficiency requirements, ease of starting and stopping, and suitability for special installations.

A review of several *Problems Associated with Mining in the Kentucky-Illinois Fluorspar District* was presented by Chester W. Shaw of the Aluminum Company of America. This district, which has been the most important source of fluorspar in the United States for more than a century, embraces the Ohio River between Paducah, Ky., and Shawneetown, Ill.

The orebodies were described as

T. L. Kessler, Foote Mineral Co., chairman of A.I.M.E.'s Industrial Minerals Division, delivered a paper on industrial minerals in the Southeastern states.

of two types—vein and bedded. Their inherent varying conditions have posed problems in roof and wall support, ore-dilution, and modification of mining methods to offset the variations. It was noted that the proximity of the Ohio River creates substantial mine water pumping problems. In addition, the depletion of richer ores must be followed by adjustments to metallurgical and milling processes in handling the separation and recovery of mineral from lower grade ores.

Such factors as rising costs—in the face of relatively stationary market prices—and foreign competition were cited. Further, it was emphasized, domestic producers have been unable to meet the rapidly increasing demand for fluospar, and as a consequence, foreign sources are now meeting about 50 percent of domestic requirements.

Mr. Shaw added that the finding of new reserves in the district is not keeping pace with the demand for the finished product. While exploration programs are being accelerated, the discovery of hidden orebodies is difficult and comes slowly. Complex faulting of the area apparently diminishes the value of geophysical methods. Aerial photogrammetry and shrewd geological interpretation seem to offer the best means of locating critically-needed ore reserves, it was said.

A description of *Operations at the Canadian Johns-Manville Asbestos Mine (Jeffrey)*, was presented by J. O. Eby, Canadian Johns- Manville Co., Ltd. At this facility the daily milling rate is 21,000 tons of ore, 13,000 tons of which is hoisted from the underground workings. (See PIT AND QUARRY, June, 1957, p. 122.)

Along with a brief description of the mill control, the speaker outlined the problems and development of the present underground block caving mining system. While a portion of the ore for mill feed is still recovered from the huge open pit, it was indicated that complete transition to underground mining is the objective in four years.

A paper prepared jointly by W. C. Lay and G. M. Bell, Aluminum Company of America, described the *Fluorspar Beneficiation at the Alcoa Mining Division Plant at Rosiclare, Ill.* During 1956, it was indicated, the mill treated ore at the rate of 9,600 tons per month. Of this amount, 28 percent was purchased ore—the balance from the operation's own vein-type deposit.

Total feed averaged 50.53 percent CaF_2, 1.29 percent Pb, and 0.72 percent Zn. The primary mill product is acid-grade fluorspar having a minimum analysis of 97.5 percent CaF_2, with lead and zinc concentrates comprising the by-products. Following crushing and treatment of the plus 10-mesh fraction in a heavy-media cone, the cone concentrate and the minus 10 - mesh fraction is ground and put through flotation lines for recovery of fluorspar, lead, and zinc concentrates.

The fluorspar circuit was described as consisting of a rougher and three cleaner sections, only the third cleaner tailings being recirculated. Lead and zinc are recovered by rougher flotation, followed by three stages of cleaning, with recirculation of the middlings.

Increased recovery of fluorspar was indicated as the principal metallurgical problem. A mineragraphic study of samples taken from various points in the flotation circuit showed that 95 percent of the fluorspar lost in the final tailings occurs as free particles finer than 100-mesh, most of the loss being minus 325-mesh.

In his luncheon address, Mr. Ankeny, director of the Bureau of Mines, told the society and conference members that those mining engineers devoted to research must be willing to specialize. Along this line, he advocated co-ordinated groups of specialists in the several fields of mining research.

Brought about by the complexity of modern mining, the need for spe-

(*Continued on page* 136)

JUST OUT!

All-new '58

DODGE *PowerGiants*

4-WAY LEADERS OF THE LOW-PRICED 3

Now—for the first time in truck history—one make leads the low-priced three *all four ways!* And that make is DODGE—all new for 1958!

From the future comes Dodge styling — handsome, sweeping, prestige-winning lines, richly trimmed in sparkling chrome.

From 40 years of truck experience comes remarkable engineering advances . . . outstanding performance, load capacities and economy.

See these great new trucks soon. And be *sure* to get your Dodge dealer's special 40th-anniversary deal before you buy any other make!

1 **FIRST IN PAYLOAD!** Advanced construction gives extra strength *without* extra weight, lets you haul up to ⅓ more, cut down on trips.

2 **FIRST IN POWER!** New 204- to 234-hp. *Power Giant* V-8's! Extra power cuts trip time, lets you pass more safely, reduces engine strain.

3 **FIRST IN ECONOMY!** Most advanced of all V-8 truck engines. Exclusive Power-Dome combustion increases gas mileage, cuts upkeep costs.

4 **FIRST IN STYLING!** All-new design! Deluxe chrome grille and trim . . . modern dual headlights . . . future-inspired lines . . . smart new colors.

TURN PAGE FOR FULL-LINE STORY →

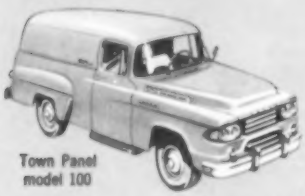
There's a

'58 DODGE *PowerGiant*

for every job . . . for every business . . . for every pocketbook

Low-tonnage models

Pick-up
model 100



Town Panel
model 100

Town Wagon
model 100

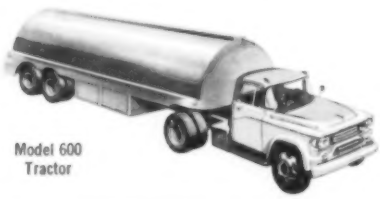
Forward-Control
model P300

Medium-tonnage models

Model 400
Van Body

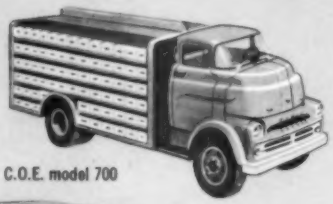
Model 500—Stake

Four-Wheel-Drive
W500
Chassis



Model 600
Tractor

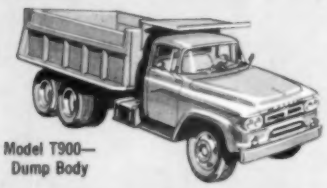
Heavy-duty models



C.O.E. model 700

Model 900—
Tractor

Model T800—
Mixer Body



Model T900—
Dump Body

CONDENSED SPECIFICATIONS

CONVENTIONAL MODELS

G.V.W. Range
4,250 lbs. to 9,000 lbs.
Engines
120-hp. 6-cylinder
204-hp. V-8

4-WHEEL-DRIVE MODELS

G.V.W. Range
5,100 lbs. to 10,000 lbs.
Engines
113- 120- 125-hp. 6-cyl.
204-hp. V-8
204-hp. V-8 (Heavy-Duty)

FORWARD-CONTROL MODELS

G.V.W. Range
6,000 lbs. to 9,000 lbs.
Engines
120-hp. 6-cylinder
204-hp. V-8

CONVENTIONAL MODELS

G.V.W. Range—11,000 lbs. to 22,000 lbs.
Engines—125- 130- 141-hp. 6-cyl.
204- (H.D.) 207-hp. V-8's

C.O.E. MODELS

G.V.W. Range—15,000 lbs. to 22,000 lbs.
Engines—204- (H.D.) 207- 218-hp. V-8's

4-WHEEL-DRIVE MODELS

G.V.W. Range—15,000 lbs. to 20,000 lbs.
Engines—130-hp. 6-cylinder
204- (H.D.) 207-hp. V-8's

SCHOOL BUS MODELS

G.V.W. Range—10,500 lbs. to 22,000 lbs.
Engines—125- 130- 141-hp. 6-cyls.
204- (H.D.) 207-hp. V-8's

FORWARD-CONTROL MODELS

G.V.W. Range—7,500 lbs. to 15,000 lbs.
Engines—120-hp. 6-cylinder
204-hp. V-8

CONVENTIONAL MODELS

G.V.W. Range
18,500 lbs. to 30,000 lbs.
Engines
218- 224- 234-hp. V-8's

C.O.E. MODELS

G.V.W. Range
18,500 lbs. to 25,000 lbs.
Engines
218-hp. V-8

TANDEM MODELS

G.V.W. Range
26,000 lbs. to 46,000 lbs.
Engines
218- 224- 234-hp. V-8's

SCHOOL BUS MODELS

G.V.W. Range
17,500 to 23,000 lbs.
Engines
218-hp. V-8

N.L.A. Operators' Meeting

Covers Blasting, Dust Control Equipment, Instrumentation

By BUREN C. HEROD

ANOTHER ON THE SPOT REPORT

THE National Lime Association operating meeting held October 17 to 19 at the Commodore Perry Hotel, Austin, Tex., drew one of the largest attendances in the group's history. A total of 160 were registered, including representatives from 35 United States and 3 Canadian member companies. An excellent program of operating papers and discussions was complemented by addresses on equipment developments, product utilization, and allied research programs. In addition, the group was conducted on tours of two lime-producing facilities and was provided with interesting and unusual social activities.

As in the preceding separate operating sessions of 1954 and 1956, the plant tours on the opening day of the meeting were high points of the program. The plants toured on this occasion were the Austin White Lime Company's operation at McNeil, and the New Braunfels plant of the United States Gypsum Company.

The following two days of the meeting were devoted to the presentation and discussion of the various technical papers. A wide range of topics was covered, including such subjects as blasting procedures involving the use of ammonium nitrate explosives, the application of scrubbers and other units in dust control, a survey of stand-by fuels and installations for rotary and vertical kilns, and kiln instrumentation.

In addition to these operating considerations, recent developments in two new types of kilns were discussed, as well as the subjects of re-

P. L. Corson (left) and A. B. Moser, with the trophies won in the A1 and A2 categories. Respectively, the winning plants were the Plymouth Meeting, Pa., operation of G. and W. H. Corson, Inc.; and the Lee, Mass., plant of Lee Lime Corp.

Fred Warner (left) accepted the trophy for the Bell plant of The Warner Company at Bellefonte, Pa., winner of group B honors. In group C, the South Chicago plant of Marblehead Lime Co. won the trophy, with Clarence Jorgenson accepting the plaque.

Bob Boynton (left) N.L.A. general manager, and Irving Warner (right) one of N.L.A.'s longest active members, greet two of the association's newest members. At right center is S. G. Price, Gibsonburg Lime Products Co., Gibsonburg, Ohio; and at left center, his son W. H. Price II.

Chairmen of the technical sessions were (left to right): Dudley F. Woodbridge, general manager, Texas Lime Co.; Ed Cornwell, Austin White Lime Co., who also acted as general chairman of the meeting; and Del George, superintendent, New Braunfels plant, U. S. Gypsum Co.

search on limestone and dolomite and the use of lime in road stabilization projects.

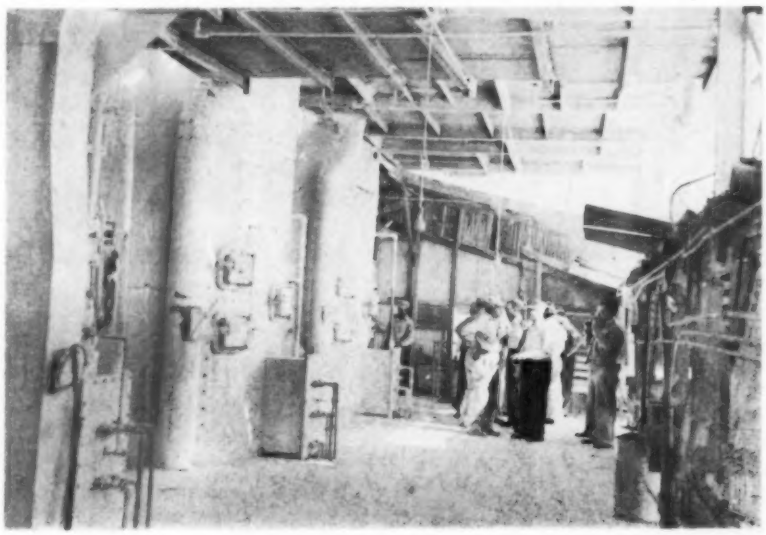
Initiated by a luncheon sponsored by the Austin White Lime Company and U. S. Gypsum and held on the opening day between the two plant tours, the social program included the annual banquet, a cocktail party aboard the stern-wheel riverboat *Commodore* while enroute up the Colorado River to the *Greenshores* resort, and, at the latter, a Texas barbecue fiesta. Entertainment for the ladies while the daily meetings were in progress, included visits to points of interest in the Austin-San Antonio area. These activities were arranged by Flora Louise Robinson of the Austin White Lime Co.

As an added point of interest for those attending the meeting, the Allis-Chalmers Manufacturing Company representatives had arranged for a model of a prototype atomic energy utility plant to be put on display in the lobby of the Commodore Perry. The full-scale installation will be operating in Illinois.

The success of the meeting and related activities was due to the efforts of the program committee and the association's operating committee. Members of the former group were Ed Cornwell (Austin White Lime Co.), chairman; Del George (superintendent, U. S. Gypsum Co., New Braunfels); and Dudley F. Woodbridge (general manager, Texas Lime Co., Cleburne, Tex.). Members of the operating committee include C. E. Baxter (Ash Grove Lime & Portland Cement Co.), chairman; Clarence Stielstra (Dow Chemical Co., Ludington, Mich.); J. G. Wilson (Warner Co., Philadelphia, Pa.); and Fred Witmer Jr. (Ohio Lime Co., Woodville, Ohio). Messrs. Cornwell, George, and Woodbridge also served as chairman of the three technical sessions.

Plant Tours The Austin White Lime Co. plant at McNeil was the first stop of the plant tours. The group was taken first to the extensive quarry site and then to the plant proper, where the various phases—from primary crushing to packing—were toured at will. This plant incorporates six Azbe-type kilns, one of which was in the final stages of installation during the group's visit. These units were reported to have a daily capacity of approximately 50 tons each.

Following the luncheon noted above, the tour continued at the New Braunfels plant of U. S. Gypsum. Here a new crawler-mounted Reich rotary blast hole drill was observed in operation prior to stopping at various points in the processing line. About two years ago a Kennedy-Van Saun preheater-rotary kiln-deheater system was installed to supplement operations of the existing ten vertical kilns (see PIT AND QUARRY, May, 1956, p. 107). These units, along with the raw-material-handling system, were of considerable interest to the visiting operators.



During the plant tour the group inspected the vertical kilns of the Austin White Lime Co. at McNeil.

NEW RESULTS OF MONSANTO RESEARCH IN USE OF AMMONIUM NITRATE AS AN EXPLOSIVE

Typical shot with Monsanto's new kind of prilled NH_4NO_3

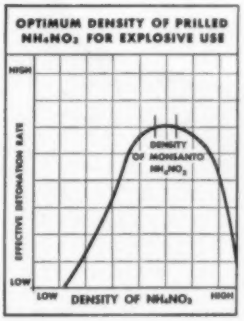
View of area involved in the blast. Shot was made in heavy columnar basalt at dam site. Used as an explosive: a new, top-quality, prilled NH_4NO_3 that Monsanto research developed to give you optimum savings, safety, speed and ease of handling.

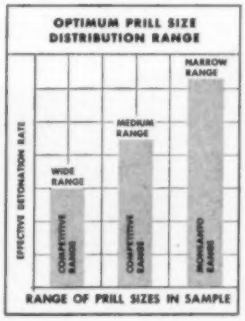
View at time of detonation. The system of detonation recommended by Monsanto, in conjunction with Monsanto Ammonium Nitrate, will yield equivalent pound-for-pound results with 60% gelatin dynamite at one-fourth the cost.

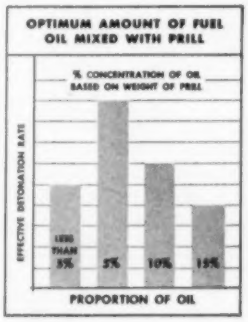
Results of blast. The powder factor in the shot above was 0.4 lbs. per cubic yard. Breakage of rock was considered ideal by contractor. Monsanto's experienced staff can give you complete technical service. Just phone Monsanto.

Photos courtesy of MORRISON-KNUDSEN COMPANY, INC.

Monsanto Ammonium Nitrate is now produced according to the specifications determined by these findings of Monsanto research. Result: more effective blast at greater savings. Monsanto is the world's largest manufacturer of prilled ammonium nitrate—and leader in developing the use of NH_4NO_3 as an explosive for open work. Request report presenting latest research findings.







CALL ST. LOUIS WYdown 3-1000 COLLECT — OR WIRE NOW FOR COMPLETE INFORMATION

MONSANTO CHEMICAL COMPANY
Inorganic Chemicals Division
Dept. F-1, St. Louis 24, Missouri
In Canada: Monsanto Canada Ltd., Montreal

Monsanto®

Where Creative Chemistry Works Wonders For You

THE
ACL
SYSTEM

CLEAN

Stack discharge is merely a wisp ...with ACL System

The introduction of the *ACL* kiln clinkering system marks a bright new era . . . an entirely new concept of *cleanliness* in cement making. This modern cement-burning method is so clean that a plant has been built in the heart of a large city. With a stack discharge aptly described as "merely a wisp," the *ACL* System has no trouble meeting the most stringent air pollution codes.

But cleanliness is just one of the many advantages of the *ACL* System. Maximum burning efficiency, reclamation of material, fuel economy, power savings, conservation of space — all these benefits are yours when you utilize the *ACL* System in coping with the challenge of more cement . . . better cement at lowest cost.

For complete information see your nearby Allis-Chalmers representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. Ask for Bulletin 07B8431.

ACL is an Allis-Chalmers trademark.

A-C ALLIS-CHALMERS

A-5448

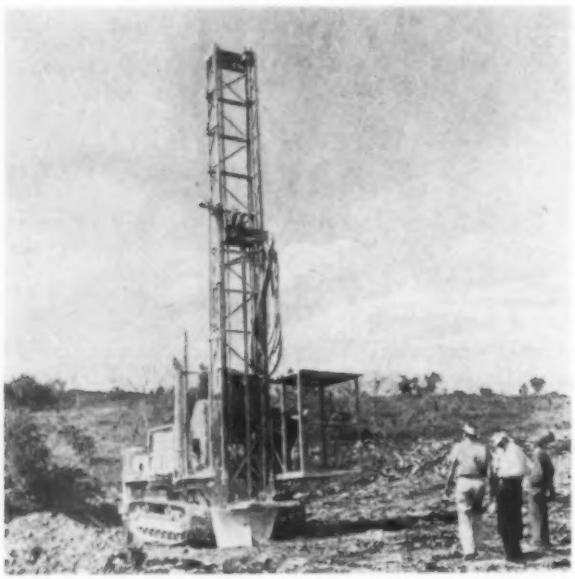
ALLIS-CHALMERS

Blasting The first operating session, presided over by Ed Cornwell, was opened by F. C. Mallery, plant manager, National Gypsum Company, Luckey, Ohio. The topic was *National Gypsum Company Developments in Blasting Practices Using Ammonium Nitrate Explosives.*

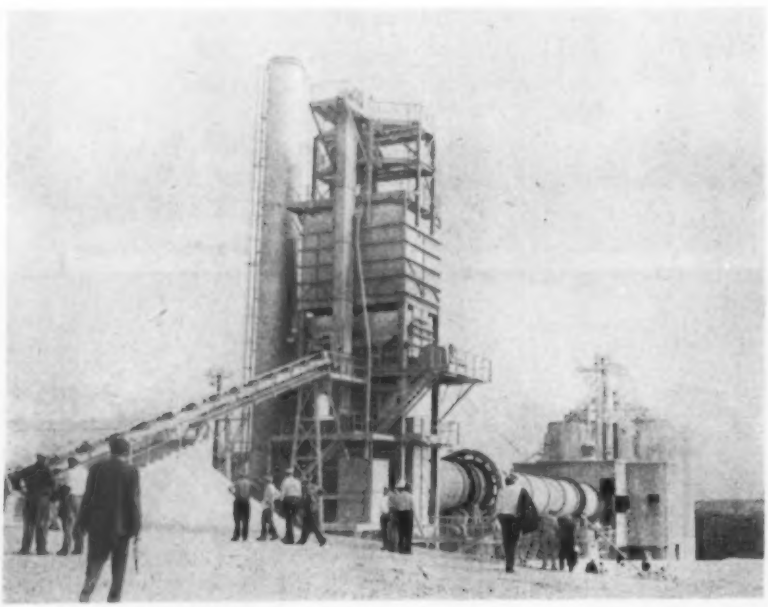
Prefacing his discussion with comment on the chemical and mechanical manufacturing processes involved in producing prills of fertilizer grade ammonium nitrate explosives, Mr. Mallery noted that the work done with this material at Luckey during the last two years has been both interesting and rewarding.

Although ammonium nitrate was put to use principally in agriculture since the war, its new role in primary blasting is a subject of increasing interest. The speaker noted that many companies that are already using the material for the latter purpose are aware of the following factors, but those who are still contemplating such use may be assured of its safety, adaptability, blasting efficiency, and economy.

Briefly, Mr. Mallery discussed some of the characteristics of ammonium nitrate, mentioning that the material melts at 337 deg. F., and that when heated to about 410 deg. F., it starts to decompose into nitrous oxide and steam, with a small amount of heat released. However, when heated further to about 510 deg. F., the heat released by the compound is quadrupled, and decomposition products include free oxygen and nitrogen. A chemical process in which considerable heat and gas are produced can be considered explosive, it was pointed out, and therefore the high temperature decomposition of ammonium nitrate can be classified as an explosive reaction. When an explosive charge is detonated in ammonium nitrate, the rate of decomposition can be so rapid that an explosive effect is realized.



A crawler-mounted blast-hole drill was observed in operation at the quarry of the U. S. Gypsum lime plant at New Braunfels.



Another interesting point on the plant tour. The preheater and rotary kiln at the New Baunfels operation of U. S. Gypsum. This plant was described in the May, 1956, issue of PIT AND QUARRY. There are also ten vertical kilns in operation at this plant.

The speakers described the disaster at Texas City of ten years ago, when an ammonium nitrate cargo in a freighter exploded. In that instance efforts to control a fire that had broken out in a hold containing this material included sealing the hold and introducing steam. In view of the fact that when ammonium nitrate reaches a high temperature in a confined space, with reaction heat and decomposition products retained, an explosion is imminent, and the terrific blast at Texas City was a natural consequence of these conditions.

Naturally, Mr. Mallery pointed out, such an occurrence raises the question as to the safety of the material. However, the Texas City disaster is, so far as is known, the only time that fertilizer grade ammonium nitrate has exploded due to fire conditions. It is not cap sensitive, nor can it be detonated by a rifle bullet as dynamite can be. Despite these characteristics it was emphasized that since it can be put to use as an explosive, it should surely be accorded the same precautions and respect as any other blasting agent.

In addition to its relative safety, other favorable factors inherent in ammonium nitrate explosive are adaptability, efficiency, and economy. Available in either 50- or 80-lb. moisture-resistant paper bags, it is described as easy to handle, store, and/or load. Further, when properly placed and detonated, the experience at the Luckey operation indicates that it could be substituted pound for pound for dynamite, with at least equal fragmentation realized. With respect to cost, Mr. Mallery indicated that a recent shot in which 8 holes were detonated with as much

ammonium nitrate as was considered best following earlier experiments—resulted in a saving of just under two cents per ton of rock shot down.

Describing a typical loading, the speaker stated that a 25-lb. stick of Amocore—principally ammonium nitrate with a gelatin core—is lowered to the bottom of the hole. This is followed with a 25-lb. stick of Apex No. 1 high-velocity dynamite containing an electric blasting cap. A similar stick is placed just above, with Primacord tied to it and a second blasting cap—also millisecond delay. These primers are topped with more 25-lb. sticks of Amocore until the top of the normal water table is reached.

From 150 to 200 lb. of prilled ammonium nitrate is then poured into the hole, with a 5-lb. stick of 40 percent gelatin placed in the center of this charge as a primer. Fuel oil is poured over the prills, during the charging, at the rate of about one gallon of oil per 100 lbs. of prills. The oil provides a combustible for the oxygen liberated from the ammonium nitrate, produces additional gases and heat which aid the reaction, and helps protect the prills from moisture.

From this point to about 10 ft. from the top of the hole, the decks are loaded similarly to the procedure described above. However, depending on the burden, only 20 to 60 lb. of prills are used in the upper decks. Stemming is done with small stone (Ohio No. 6). To break up and scatter the top rock, 12½ lb. of Apex No. 1 is placed about 10 ft. below the top of the hole and this is followed by the final stemming.

It was pointed out that, with present methods, the primary explosives cost can be cut at least 50 percent, and it is expected that even more economy will be attained as new methods are developed. In answer to questions during a discussion period, the speaker stated that 2-in. holes are apparently the minimum feasible, and, in regard to primers, he said that at the Luckey operation they have used as low as 6 percent of the latter in relation to the entire hole charge.

Dust Control *The Texas Lime Company's Application of Scrubbers and Dust Control* was presented by Dudley F. Woodbridge, general manager of that firm. Among the circumstances which forced the company to take various steps toward combating the dust problem were the location of the lime plant at Cleburne, Tex., and a number of lawsuits resulting from alleged dust nuisance and damage. This litigation, as noted elsewhere in this issue, culminated in a decision by the Texas Supreme Court favorable to Texas Lime Company.

As related by the speaker, the plant was built on a tract about ¾ of a mile south of the city limits, and is only 1½ miles from the heart of the city. The site was selected because of the availability of gas and electric utility lines, and its proximity to a railroad.

An apparently unfavorable factor, however, developed in the case of prevailing winds, which are from the south and at an average velocity between 15 and 20 m.p.h. Naturally any dust created in plant operations was generally carried toward the city. The first complaints originated with the immediate neighbors, and later from an association of used car dealers (located from ¾ to 2 mile from the plant). Lawsuits brought by the latter were the subject of the Supreme Court decision.

All screening and sizing of stone had been done above an open stockpile, about 40 ft. high, and this procedure was a ready source of dust. The situation was remedied by enclosing the screens and covering the entire stockpile with a sheet steel structure. Dust created by haulage units bringing in stone was stopped by hardsurfacing all haul roads on the plant site.

With respect to processing units, several steps were taken. The Kritzer type hydrator was a ready equipped unit with a Norblo bag-type dust arrestor; and to clean the stack discharge, a water spray was installed in the hydrator exhaust stack. The spray water falls back into the high-speed mixer ahead of the hydrator, and the only discharge from the stack is steam.

The most important remaining points requiring attention for dust control were the stacks for the stone dryer and the rotary kiln. After several months of investigation, Mr. Woodbridge indicated, it was decided to install Peabody Engineering Corporation wet scrubbers. That handling the rotary kiln gases has a diameter of 9 ft. 6 in., while that for the dryer is 4 ft. 6 in.

Each is a stainless steel vertical cylindrical shell comprised of three main zones—a humidifying lower section, a slot impingement section, and an entrainment separation section. Due to the high calcium oxide content of the dust being handled, the gases are subjected to an extremely heavy spray zone to assure complete saturation.

Analyses made by separate engineering firms of the discharge gases, after passing through the scrubbers, show efficiencies above 95.5 percent. The larger scrubber uses approximately 50 gal. of fresh water per minute and more than 125 g.p.m. of recirculated water. The smaller unit uses about 20 and 45 g.p.m., respectively.

Dust-laden water discharge from the scrubbers is pumped to a sludge pit through 3-in. molded rubber pipe. Water drained from the sludge pit enters an intermediate settling basin and then a pump pit, from which it is returned to the dust control system.

A second rotary kiln on which installation is nearly complete will also be fitted with the same type of wet scrubber, according to Mr. Woodbridge. During a question-and-answer period the speaker noted that scrubber maintenance includes a periodic cleaning of spray nozzles and impingement section.

ACL Kiln *The Progress of the ACL System* was reviewed in a paper prepared by C. E. Barnett and E. C. Mertz, processing machinery department, Allis-Chalmers Manufacturing Co., and presented by Mr. Burnett. The authors pointed out that thus far the ACL (Allis-Chalmers-Lellep) traveling grate-kiln system, which was originally designed for the production of cement, has naturally been utilized primarily in that field. Over 200 of these systems, both single- and double-pass, have been sold, with the majority destined for overseas plants.

Recently completed extensive test work for the iron ore industry has shown that this system can be advantageously used for burning pelletized magnetite concentrates for production of hematite pellets for blast furnace feed. While at present there are no ACL systems operating with limestone, Dr. O. G. Lellep, inventor of the system and consultant in the processing machinery department of Allis-Chalmers, has stated that his European licensee has received an order for a unit that will process 170 to 200 tons of lime daily from limestone feed. The plant will be built in Belgium.

Early use and development of the traveling grate-kiln combination occurred in Europe and Asia, where it was evolved as a solution to high fuel costs. The single-pass system, in which kiln gases pass only once through a bed of feed pellets on the traveling grate, was the forerunner of the double-pass system. The latter was developed by Dr. Lellep to im-

prove fuel economy and an already low dust loss of the earlier installations.

The double-pass ACL system has a dust loss of ½ to ⅓ that of the single-pass units, or a maximum of about 1 percent of feed by weight. With respect to fuel consumption, the newer development produces with at least 100,000 B.t.u. per bbl. less than the single-pass system. Double-pass installations in Europe are reported to have an average fuel consumption of about 600,000 B.t.u. per bbl.

A combination of traveling grate and rotary kiln, the ACL system was described as a "marriage" of the best operating characteristics of each. To this union the advantages brought by the rotary kiln were said to be a uniform heat treatment of the pelletized feed, the ability to use any type of fuel—coal, oil, or gas, and ruggedness and dependability. Benefits ascribed to incorporation of the traveling grate included good heat transfer—due to the double passage of the gases through the pellet bed; low dust loss; and no segregation of raw feed on the grate, since pelletizing of the raw material provides size uniformity and avoids segregation or fluidizing.

The operation of the ACL system was summarized as follows: The ACL grate consists essentially of a slow-moving traveling conveyor made up of chain and castings, similar to a stoker grate, with the grate enclosure divided by baffles into two chambers — drying and pre-burning compartments. Pellets are fed at a controlled rate to the initial chamber, where they are exposed to a downdraft of relatively cool gases at 500 to 600 deg. F.

Following this drying, the pellets enter the pre-burning chamber, where the kiln exit gases, at 1,700 to 1,800 deg. F., pass through the bed and partially calcine the feed, and also accomplish heat hardening.

The pellets are then discharged into the feed end of the rotary kiln. Finished clinker from the latter is discharged into an air-quenching cooler. With respect to the gases entering the grate enclosure from the kiln, the temperature drops to 500 to 600 deg. F. after the first pass through the pellet bed. Following the second pass, in the drying chamber, the temperature is reduced to 200 to 250 deg. F., and the gas enters the stack at that level. This second pass, through the bed of initial moist pellet feed, accomplishes the final filtering of dust from the kiln gases.

In regard to preparation of raw feed—for cement materials—it was noted that the use of a pan or disc-type pelletizer has improved the operation of the system. The pan pelletizer has a classifying action that allows only the larger pellets to discharge over the lip. A pellet size range of ⅜- to ¾-in. diameter has been found most desirable for the ACL system.

Safety Awards Winners of trophies and certificates of safety in the 1956 N.L.A. Safety Competition, conducted by the U. S. Bureau of Mines, were announced and presented with their respective awards by Ken Gutschick, manager of technical services for the association. Prior to making the presentations Mr. Gutschick pointed out that there should be more participating companies in the competition than the 40 percent of the industry that took part in this one. However, 17 of the 44 plants enrolled had injury-free operations—a percentage that was equaled only in 1952 in the 22-year history of the competition. In addition, the frequency of injury occurrence was the lowest ever recorded.

Leaders in each of the four categories of the contest were presented with plaques furnished by *Rock Products*. The categories were as follows: quarries with calcining plants working 100,000 or more man-hours, quarries with calcining plants working less than 100,000 man-hours, underground mines with calcining plants, and calcining plants only.

In the first group, A1, the trophy-winning operation was the Plymouth Meeting, Pa., plant of G. & W. H. Corson, Inc., with 355,680 man-hours. P. L. Corson, chairman of the board, accepted the award for the firm.

The leader of the second classification, A2, was the Lee, Mass., plant of Lee Lime Corporation. A. B. Moser accepted the trophy for this plant, which had 90,500 injury-free man-hours of operation during 1956. Mr. Moser played a leading role in developing the safety record achieved by this firm.

In group B, top honors went to the Bell plant of the Warner Company at Bellefonte, Pa. Fred Warner received the trophy for this operation, which had a 552,357 man-hour record.

The South Chicago plant of Marblehead Lime Company totalled 102,990 man-hours in attaining top position in group C. Clarence Jorgenson, assistant superintendent, accepted the trophy for the plant crew.

These four plants, along with the rest of the 17 operations with injury-free records for the year, were also presented with the association's certificates of achievement in safety.

Calcimatic In June of this year, the original draft of a paper on a new type of circular hearth calciner was presented at the Colorado Springs meeting of the association by Ian M. Smellie, industrial consultant, Toronto, Ontario. (See PIT & QUARRY, August, 1957, pp. 88-89). In view of the resulting interest and queries, Mr. Smellie was invited to present an amplification of that original paper at this meeting. This was given under the heading of the *Development and Significant Features of the Calcimatic Process.*

In addition to the data presented in the original paper, Mr. Smellie reviewed the background leading to the development of the pilot plant located at the Galloway property of the Ash Grove Lime and Portland Cement Co. in Springfield, Mo. It was pointed out that several factors were regarded as essential to efficient industrial calcining equipment, these including foolproof operation; the ability to calcine any size of stone, particularly the smaller ones; the ability to use any available fuel; and consistency in production of top quality calcined materials with no waste.

With this in mind, the speaker said, experience in the petroleum and steel industries was regarded as of potential benefit in solving problems of lime calcining. In the early days of the former industries, it was noted, raw materials were processed in large quantities, or batches, and in cumbersome equipment in which revisions of process conditions or imposition of a new set of temperatures required lengthy periods for restablization of the process.

Analogies were drawn from current procedures in each of these two fields. In the case of petroleum refineries, where oil had once been heated by the tankful, it is now done by heating a pipe through which the oil passes, thus providing accurate control of desired temperature, pressure, and flow conditions. If changes are desired, it can be done in seconds through the twist of a dial, the speaker stated. Cumbersome batching methods in the steel industry have given way to the use of fully-automated, high-speed, continuous equipment and flow.

Before deciding how these features might be incorporated into the design of calcining equipment, Mr. Smellie continued, an analysis of basic factors involved in lime calcination was required. Essentially, the operator must drive off CO_2 from limestone through application of heat. However, it was noted, this application of heat presents complexities virtually as soon as calcination starts, *i.e.*, when the stone being calcined has an initial coating of lime, a central mass or core not yet undergoing dissociation of CO_2, and a boundary layer between the two.

As the boundary layer continues to dissociate CO_2, it was pointed out, the escaping gas actually provides a cooling of the material which it is desired to heat. This is only one of the complexities, but a primary one. Thus, Mr. Smellie said, to make the process go faster, *i.e.*, get heat through to the boundary layer as quickly as possible, the highest temperature source amenable is rerequired, and the material should be exposed to that source until calcination is practically complete. The latter stems from the fact that continued high temperature after complete calcination can damage the material. Therefore, it was pointed out, if the temperature is reduced at a point short of complete calcination, the gas still being generated from the remaining boundary layer will protect the outer lime while the center is undergoing burning to completion.

In view of the above elements in lime making, the Calcimatic design described by Mr. Smellie at the Colorado Springs meeting was develop to provide, with a circular hearth, an automated continuous processing flow. The speaker pointed out that during the process, and *via* automatic instrumentation and control of burners through the walls and/or roof of the several combustion chambers, the material is at all times undergoing accurately controllable combustion conditions.

It was noted, along this line, that most current types of calcining equipment provide the greatest heat toward the discharge end of the process, where most of the material in the flow is in the form of lime, and at which point most damage can be done by excessive heat. In the case of the Calcimatic unit, Mr. Smellie emphasized, the design provides for constant control of temperatures in all chambers through which the stone passes, from entry into the calciner to discharge.

Carbonate Research Dr. Donald L. Graf, geologist, industrial minerals division, state geological survey, Urbana, Ill., reviewed some *Fundamental Mineralogical Studies on Limestone and Dolomite*. It was pointed out that research on carbonates is affected or conducted in an atmosphere of specific individual desires or needs, *i.e.*, for such interests as the oil industry, lime production, etc. The Illinois State Geological Survey, the speaker noted, is interested in chemical and industrial applications.

Basic research, it was said, has at least two positive benefits. While the time required is substantially longer than for efforts on a smaller scale, the return at completion has a much greater potential. In addition, phenomena studied and recorded often are valuable contributions to apparently unrelated fields.

Illustrating the discussion with slides and charts showing laboratory apparatus and test results, Dr. Graf stated that chemical analysis shows the end result of a long geologic history of carbonates. In this type of work, a study of carbonate formation in present ocean areas is beneficial.

It was pointed out that limestone is forming today in two types of areas —atolls and continental shelves. Significantly, these areas, which are being built largely of the remains of marine animal life, have no proximity to river mouths. The study of biology, it was added, is basic to the study of chemical composition of carbonates since marine life is directly related to temperature and salinity of the waters where animal remains accumulate and carbonate precipitation takes place.

Kiln Instrumentation *Instrumentation of Rotary Kilns Producing Dead-Burned Dolomite* was the subject of a paper presented by W. C. Knoblaugh, staff engineer, Basic Incorporated. The rotary kilns at the Maple Grove, Ohio, plant of this company are used in the production of dead-burned dolomite refractories, and they are fed a very Silurian (Niagaran) dolomite. These units vary in size from 9 to 165 ft. to 11 ft. 3 in. by 391 ft. Speed of rotation varies from 0.5 to 1.0 r.p.m., it was noted.

The pyro-processing involved calls for heating the dolomite and iron oxide at temperatures in excess of 3,000 deg. F. Factors influencing the temperature include chemical composition, size, and rate of feed; and under certain conditions the temperature may go as high as 3,250 deg. F., it was said. Rotary or Fuller reciprocating grate-type coolers receive the clinker discharge from the kilns and provide preheated combustion air.

Instruments reported in use at present on these kilns include dust chamber temperature recorder-indicators, kiln speed recorder-indicators, kiln hood pressure recorders, dust chamber pressure recorders, and flue gas analyzer recorder-indicators for oxygen, combustibles, and CO_2.

While maintenance of constant pressure in the combustion zones has been attempted unsuccessfully with various types of furnace pressure controllers, it is felt, the speaker said, that both this unit and combustion zone temperature indicator-recorders are very desirable; and investigations of these areas of instrumentation are being continued in the hope of developing a workable system.

With respect to the various instruments now in use, the following was brought out by Mr. Knoblaugh. The dust chamber temperature recorder-indicator sensing element is in the flue gas stream in the dust chamber, and the kiln operator has learned to use this instrument to recognize loss of feed and ring formation in the kiln. Difficulties with the draft system, such as the damper operation, as well as ring formations, may be indicated by the dust chamber pressure recorder.

The kiln speed indicator provides a general story of kiln operation, Mr. Knoblaugh stated. This device, the oldest of the successful units in kiln instrumentation, is invariably provided.

Flue gas analyzer indicator-recorders are the most recent addition to the instrument group. These units provide the operator with the story on combustion and efficiency.

The only reliable indication of combustion that has been found to date at this operation, the speaker commented, is the analysis of flue gases. This analysis can be made by means of a portable analyzer, but since combustion in a rotary kiln is not a steady-state condition, the interpretation of spot checks is difficult. The desirable method, according to Mr. Knoblaugh, is the continuous analysis of the flue gases for oxygen, combustibles (or carbon monoxide), and carbon dioxide, using at least an indicator and preferably a recorder-indicator at the burner's station.

Oxygen and combustibles indicate combustion efficiency, the oxygen instrument indicating excess air being drawn into the kiln—thereby cooling

the flame, and the combustibles analyzer indicating excess fuel over that required for efficient combustion.

When kiln feed consists entirely of a limestone or dolomite, it is possible, Mr. Knoblaugh said, to indicate the kiln efficiency by the relation of CO_2 in the flue gas to the ratio of the fuel used to clinker produced. Amounts of CO_2 will differ with various fuels, and chart curves will require specific calculation for the type of fuel used.

In the initial work on continuous flue gas analysis at Basic Incorporated, the following were set as the minimum requirements of a sampling system for a rotary kiln: (1) servicing not oftener than once every 24 hours; (2) delivery of representative samples to the analyzers with only dirt and excess moisture removed; (3) a rugged system that does not require a specialist to maintain.

The inadequacies of earlier sampling systems led to lengthy study and research by both Basic and other industry members and committees. As the result of these efforts, a gas sampling and cleaning system was designed that did not use any water. The principles of the analyzers for the various gases is similar among the different manufacturers, Mr. Knoblaugh reported.

Earlier experience at Basic had indicated that instruments work best when kept clean and otherwise well maintained. Therefore the analyzers at this plant are housed in individual heated rooms at ground level for ease of access in maintenance. The sampling system is located adjacent to the gas discharge end of the kiln, and the gas samples are piped to the analyzer rooms.

Operating records show that the units operate in excess of 98 percent of the time while the kilns are operated. Daily checking and lubricating of the equipment can usually be accomplished without a shut-down. Experience with four of these systems at Basic has indicated a saving of approximately 10 percent in fuel, as well as an increase in kiln production.

Kiln Survey *The Survey Analysis Report on Kilns Using Natural Gas and Stand-by Fuels*, prepared by Irving Warner, vice-president, Warner Co., for presentation at the preceding operators' meeting was delivered at this session because of Mr. Warner's unfortunate illness at the time of the earlier meeting.

On the basis of a questionnaire sent to N.L.A. to known users of natural gas in both rotary and shaft kilns (in the lime industry), an analysis was made with respect to such factors as output, efficiency, life of lining, scaling, and standy-by fuels.

Concerning rotary lime units previously fired with coal or oil, most returns indicated a variation in output ranging from 3 percent lower to 10 percent higher. However, shaft kiln figures showed output increases of 15 to 100 percent. There appeared to be a general loss of efficiency—up to 20 percent in rotary kilns, but shaft units realized an increase of 15 to 20 percent (over coal).

Most reports from rotary kiln operators, and all from shaft kiln users, indicated a greater ease of firing control with natural gas. In regard to product quality, all shaft kiln reports, and the majority of returns on rotary kilns indicated an improvment in comparison with that obtained while formerly using other types of fuel.

While the majority of questionnaires on shaft lime kilns indicated no stand-by fuel system, those on rotary installations showed either coal or oil to be used in stand-by status. Changeover time reported for the former was recorded by the majority as instantaneous, and that for oil ranged from 2 to 30 minutes.

Lime Stabilization An interesting review of the *History and Uses of Lime Stabilization* was given by Chester McDowell, senior soils engineer, Texas Highway Department. The history of clay-lime mixtures in construction, the speaker said, are found in certain areas of Asia, where they were used in the Tibetan pyramids; in India, where clay-lime mortars were long in common use; and in Italy, where many of the old Roman roads were built on clay-lime mixture sub-bases.

In effect, he pointed out, we are now picking up where the ancients left off. These applications had been family arts, with no common specifications, and as such they are still practiced in some remote foreign areas. A scientific approach has been made in this modern day, and although this has developed primarily in the realm of engineering, some contractors are becoming familiar with the newer technology.

Using the state of Texas for illustration, Mr. McDowell noted that lime-soil mixes have been the subject of laboratory testing for 25 years. Early field testing resulted in admitted mistakes of road construction. Resultant ravelling set the project back for ten years, it was said. However, by 1945 techniques had been developed to the point that test roads could be considered nearly perfect. In fact, the performance record for the last 12 years has shown them to be excellent.

It had been learned that compaction and sealing were critical factors in constructing the wearing course of lime-stabilized roadways. It also developed that in handling gumbo, such materials as sand and cement would not provide stabilization.

In 1952, the Austin White Lime Company and U. S. Gypsum Co. donated the lime required for building a test road involving stabilization of these clays. This test has shown that lime-clay mixtures provide a good working table or base; a water barrier is formed, and the stabilized layer forms a part of the pavement depth, or sub-base. (As yet an asphalt wearing course has not been placed over a lime base in Texas.)

Pointing out that highway engineers are proceeding slowly and carefully, Mr. McDowell also indicated that a steady growth is expected in the use of lime for these purposes.

While the chemical reactions involved in treatment of soil with lime were described as actually unknown, it is believed that a basic exchange or ionization affects plasticity: a combination of calcium hydroxide with some available silica forms a type of pozzolan (the silica apparently must be colloidal or amorphous); and carbon dioxide from the atmosphere recombines with the lime to form calcium carbonate (after compaction), the reaction taking place *in situ*.

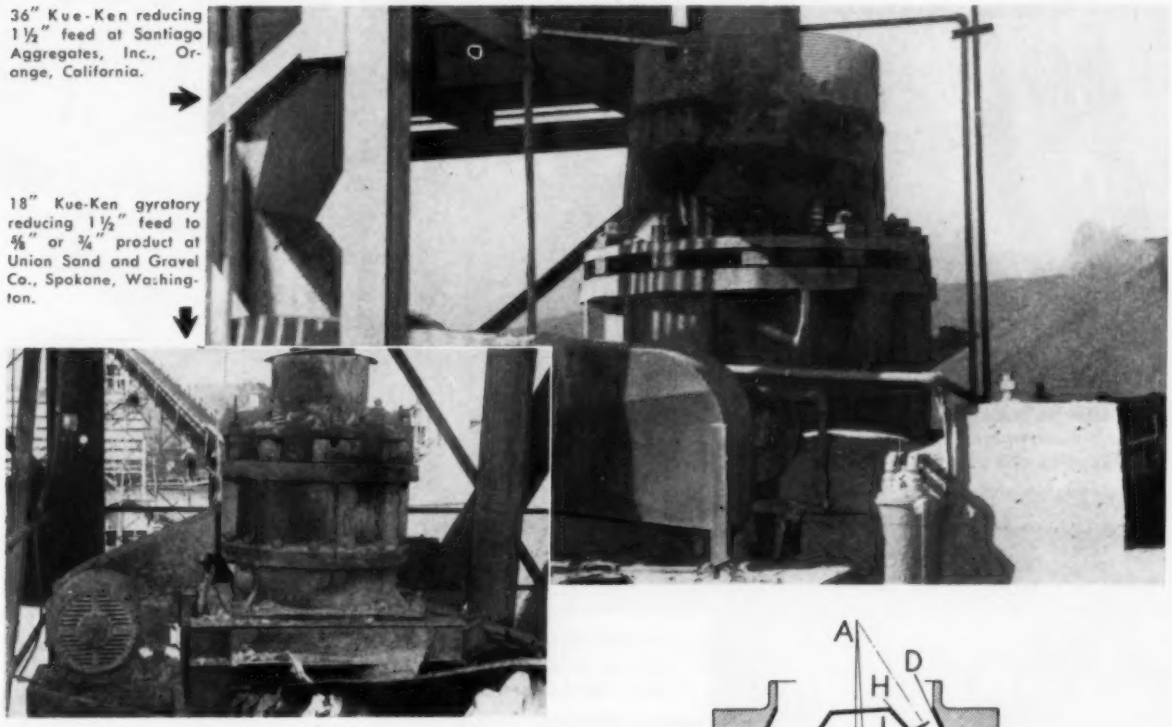
In closing, Mr. McDowell showed a series of slides depicting the equipment, methods, and results involved in lime stabilization. He indicated that in Texas the point has been reached where lime sufficient to meet stabilizing needs must be imported from other areas.

Banquet As a testimonial to his 53 years of continuous service in the lime industry, the annual banquet was dedicated to Irving Warner. In the words of M. A. Rickard, N.L.A. president, Mr. Warner has been a far-sighted pioneer in the lime industry and he has become well known in international lime circles. In addition to writing a number of technical papers, he has regularly toured the country from coast to coast to visit lime plants and discuss industry problems. In recognition of his unselfish efforts toward the industry's welfare, the association presented Mr. Warner with an engraved silver tray.

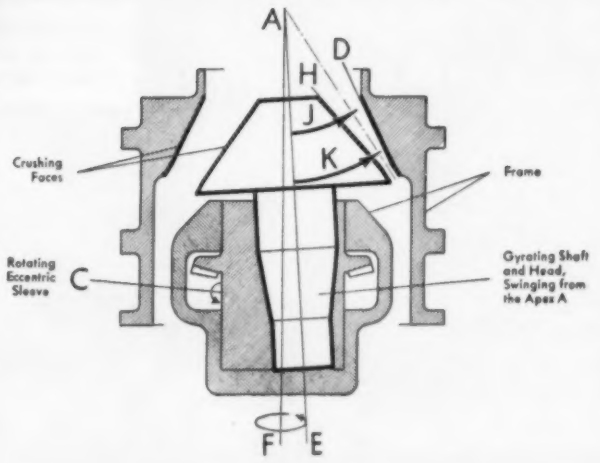
Kue-Ken® Gyratory handles all secondary crushing in high efficiency plants

36" Kue-Ken reducing 1½" feed at Santiago Aggregates, Inc., Orange, California.

18" Kue-Ken gyratory reducing 1½" feed to ⅝" or ¾" product at Union Sand and Gravel Co., Spokane, Washington.



The new gravel processing plants of Santiago Aggregates, Inc., Orange, California and Union Sand and Gravel Co., Spokane, Washington producing up to 175 tph of finished product use Kue-Ken gyratories exclusively for their secondary crushing. Kue-Ken takes choke feed. It fits ideally into flow sheets where head room is limited and makes economical gyratory crushing practical in most any operation. Kue-Ken liners wear longer even under continuing, hard materials crushing. The crusher is designed on the exclusive Kue-Ken "crushing without rubbing" principle that eliminates the main cause of liner wear. Though exceedingly strong, Kue-Ken is sufficiently compact and light to be used in either a permanent or portable installation.



Kue-Ken crushes without the upward abrasive action that quickly wears out liners in ordinary crushers. See how crushing faces above pass through crushing zone on arcs J and K to crush rock squarely. Only Kue-Ken operates on this principle. "Crushing without rubbing" lengthens liner life.

WRITE FOR CATALOG

KUE-KEN® CRUSHERS

"Crushing without Rubbing"

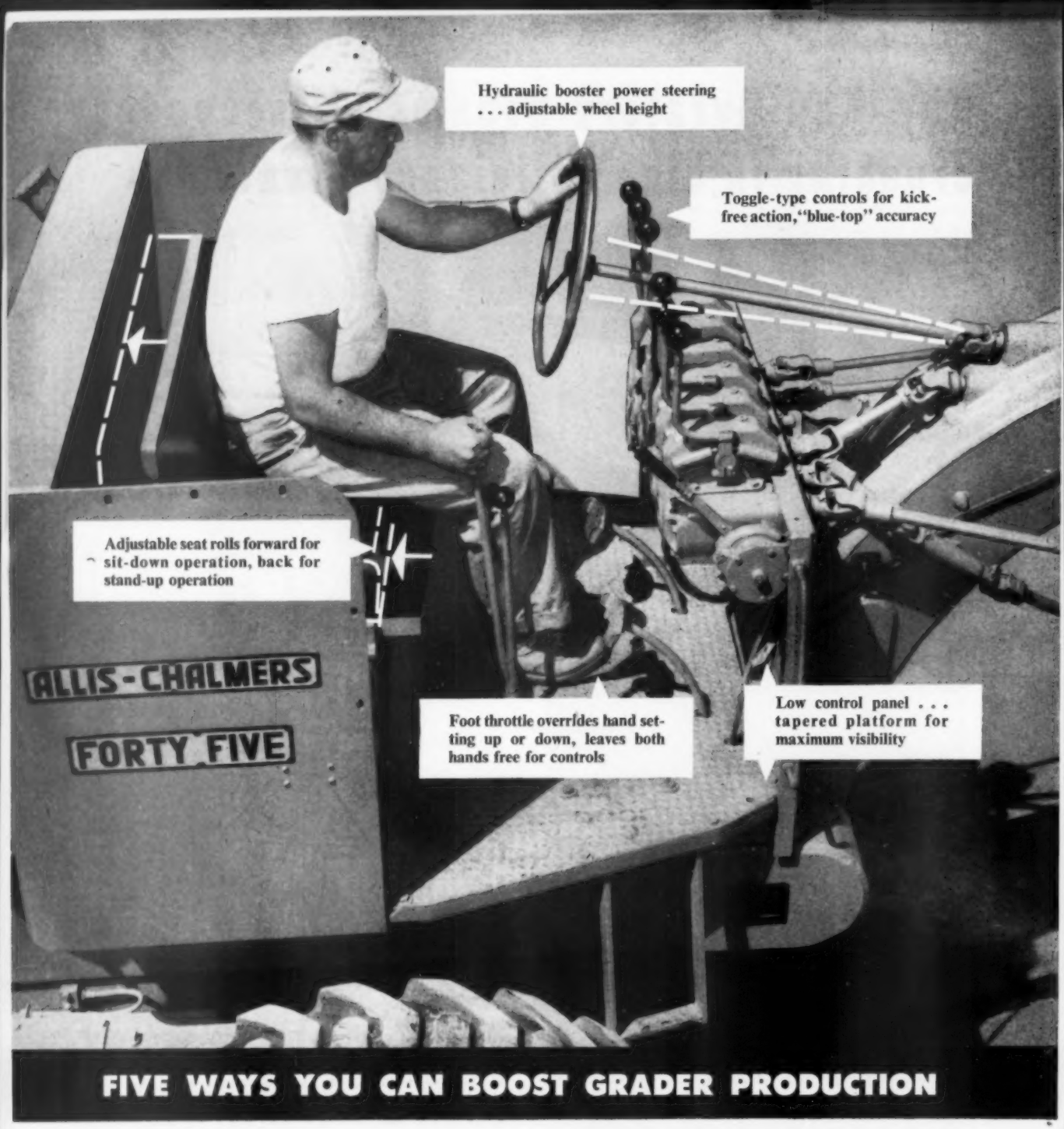
STRAUB MFG. CO., INC. 8386 Baldwin St., Oakland 21, Calif.

Jaw Crushers Gyratory Crushers Overhead Eccentric Crushers Revolving Screens
Classifiers Feeders Rib Cone Ball Mills Concentrating Tables Vibrating Screens

DEALERS:

SEATTLE, WASH. ..... Washington Machinery Co.
SALT LAKE CITY, UTAH ..... Lund Machinery Co.
SAN ANTONIO, TEX. ..... Closner Equipment Co.
PORTLAND, ORE. ..... Contractors Equipment Co.
LOS ANGELES, CALIF. ..... Garlinghouse, Fremon Co.
PHOENIX, ARIZ. ..... Stapley's
DENVER, COLO. ..... Union Supply Co.
CASPER, WYOMING .... Moss Equipment & Supply Co.
VANCOUVER, B. C. ..... Universal Equipment Co.

Pennsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.
Armstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor, Close Works, Gateshead-upon-Tyne 8, England


Hydraulic booster power steering . . . adjustable wheel height
Toggle-type controls for kick-free action, "blue-top" accuracy
Adjustable seat rolls forward for sit-down operation, back for stand-up operation
ALLIS-CHALMERS
FORTY FIVE
Foot throttle overrides hand setting up or down, leaves both hands free for controls
Low control panel . . . tapered platform for maximum visibility
FIVE WAYS YOU CAN BOOST GRADER PRODUCTION

. . . *through operator comfort and control!*

Features like these make satisfied operators . . . mean more production for you. They're yours in an Allis-Chalmers FORTY FIVE—120 brake hp, 23,800 lb. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

Interesting Features Observed at Cauldon Works Of Blue Circle Group

British cement organization adds 28th plant in chain throughout Great Britain

The Blue Circle Group of cement companies is said to be the largest such organization in the world, having 28 plants in Great Britain and interests in 10 plants overseas, 8 of which are in the British Commonwealth. It also operates 21 other manufacturing plants.

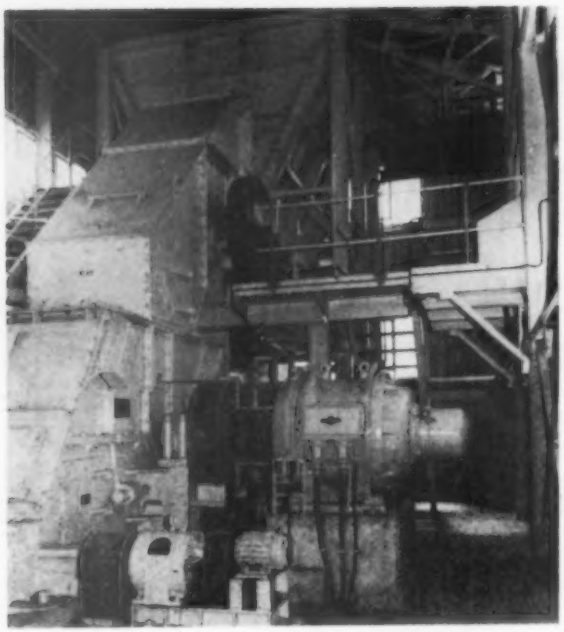
The Group is composed of The Associated Portland Cement Manufacturers Ltd.; The British Portland Cement Manufacturers Ltd.; Alpha Cement Ltd.; The Cement Marketing Company Ltd.; G. & T. Earle Ltd.; and The South Wales Portland Cement & Lime Co. Ltd.

CAULDON WORKS, the latest addition to the Blue Circle Group, is situated in Staffordshire, between Ashbourne and Leek, and east of Stoke-on-Trent, England. This cement plant, which went into production at the end of April, 1957, will have an annual production of approximately 200,000 tons. Among interesting features are vertical raw material drying and grinding mills; a quadrant blending system; a Lepol kiln; modern employee housing, etc.

Raw materials for the manufacture of portland cement are available close to the site. These consist of shale, which is of carboniferous age, and carboniferous limestone, which dips beneath the shale in the works area. The ratio of limestone to shale for cement production is about 4:1, together with a 1 percent to 1½ percent addition of iron oxide.

Limestone Limestone is recovered by a 2½-cu. yd. Ransome & Rapier Type 490 face shovel

An aerial view of the plant from the north. The conveyor from the quarry is seen in the background; the shale conveyor is at the right.



Shale is carried to this receiving hopper for the hammer crusher. The apron feeder is seen above.

operating on a 3-kv. power supply, after drilling and blasting; the drilling rig is a Ruston Bucyrus diesel-driven blast hole drill, No. 27T, plus a Holman SL.16A wagon-mounted pneumatic drifter drill. The face shovel loads three 9-cu. yd. Foden diesel dumpers, which deliver to the intake of the crushing plant.

The plant, which is housed in a massive reinforced concrete building having its intake at quarry level, is planned for a full-scale output of 450 t.p.h.; but while the primary crusher and its ancillaries are capable of this output, only half the dual secondary crushing plant has been installed at present, so that the plant as a whole is limited to 225 t.p.h.

Stone dumped into the large receiving hopper over the heavy-duty pan feeder, supplied by Fraser & Chalmers Engineering Works (G.E.C.). This unit discharges into the 42-in. gyratory crusher (250-hp. drive), capable of reducing stone from 36 in. to 6 in., which, in turn, delivers to the 42-in. belt conveyor rising to the top of the separate surge bunker of 70-ton capacity. From one of the twin outlets of this bunker, a Locker vibrating feeder extracts stone onto the 36-in. belt conveyor feeding the secondary crusher, which is protected from tramp iron by a magnetic pulley at the head of this conveyor.

The secondary crusher is a 5½-ft. Symons cone crusher which, like the primary crusher, was manufactured by Fraser & Chalmers for the Nordberg Manufacturing Co., Limited. This unit has an output of 225 t.p.h. of minus 1¼-in. stone, and requires a 200-hp. motor.

The product then passes to a pair of Symons horizontal double-deck screens having top decks of 1¼-in. sq. mesh, and blank bottom decks; the oversize is returned to the 42-in. belt conveyor for recrushing, while the fines pass, *via* the bottom decks, to a 36-in. belt conveyor 1,500 ft. long, which delivers to one of four compartments of the limestone bunker, *via* a travelling tripper having a reversible transverse conveyor of 30-ft. centers. The openings into the compartments run full length, and where they are not occupied by the conveyor chutes, they are closed by a travelling rubber cover, developed and supplied by Mavor & Coulson Ltd.

All the limestone conveyors were provided by Mavor & Coulson Ltd. and the Symons screens were made for the Nordberg Manufacturing Company by Stothert & Pitt Ltd., of Bath.

A Visco Beth dust collection plant, capacity 13,500 c.f.m., is included in the crusher building to vent the cone crusher, stone chutes, etc.

Shale Shale is dug by a 1½ cu. yd. electric face shovel operating on 415-v. supply; this dumps into a movable hopper from which the shale is fed by a 48-in. belt feeder on to the first two 36-in. field belt conveyors, thence to a permanent 36-in. belt conveyor delivering into the crushing plant receiving hopper. This last conveyor is equipped with a Goring-Kerr electronic metal detector, which on detecting a piece of tramp metal (ferrous or non-ferrous) sounds a klaxon and stops the belt conveyor system.

A 54-in. wide steel plate apron feeder passes the shale from the hopper to a Dixie hammermill (size 5050) which, having moving breaker and back plates, is especially suitable for sticky materials; it is capable of reducing 150 t.p.h. of shale from 12 in. to minus ¾ in. and it can accept occasional lumps up to 30 in.; drive is by direct-coupled 300-hp. 730 r.p.m. motor.

A Polysius circular-type dust filter (capacity 11,000 c.f.m.) has been installed to produce a down draft through the mill.

The crushed shale is discharged on to a 60-in. flat belt conveyor which also collects droppings from the apron feeder, and then discharges on to a 24-in. troughed belt conveyor which rises to the shale storage; here the material is distributed over the full length of the storage by a reversible shuttle conveyor.

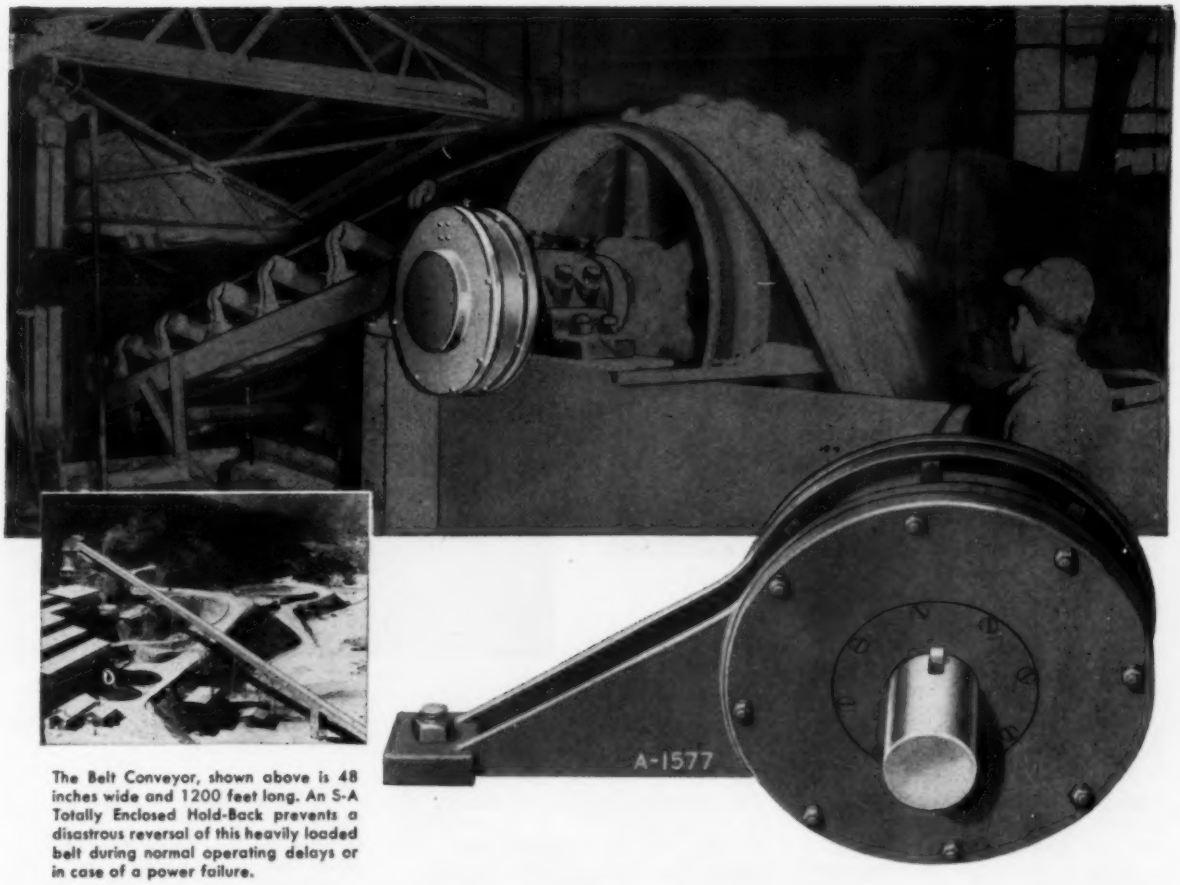
The whole of the shale conveying system has been supplied by Hugh Wood & Co. Ltd., and the receiving hopper, apron feeder and hammermill are of Fraser & Chalmers design and manufacture.

Raw Materials Storage Limestone is, as earlier described, stored in a 4-compartment reinforced concrete bunker, with a gross capacity of 6,000 tons; each compartment has a single outlet.

Shale, deposited by the shuttle conveyor, is spread and subseqently trimmed by an electric overhead travelling clamshell crane with a payload of approximately 4 tons, over the 60-ft. length of the storage, gross capacity 1,500 tons. This crane also handles iron oxide and gypsum. Four outlets are provided in the bottom of the shale storage.

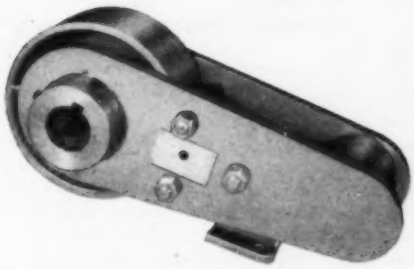
Iron oxide is dumped by trucks into a grab pit, from which it is transferred by clamshell, either to a reserve storage of 150-ton capacity, or to feed bunker of 280-ton gross capacity, which has two discharge openings.

Raw Grinding Raw materials are dried and ground in what is really the latest development of an airswept edge-runner mill, the product being recovered in a combined mechanical and electrostatic collector. There are two separate grinding units, capable of independent operation. Each consists of feed,



The Belt Conveyor, shown above is 48 inches wide and 1200 feet long. An S-A Totally Enclosed Hold-Back prevents a disastrous reversal of this heavily loaded belt during normal operating delays or in case of a power failure.

Prevent the reversal of conveyors and elevators with STEPHENS-ADAMSON TOTALLY ENCLOSED HOLD-BACKS!



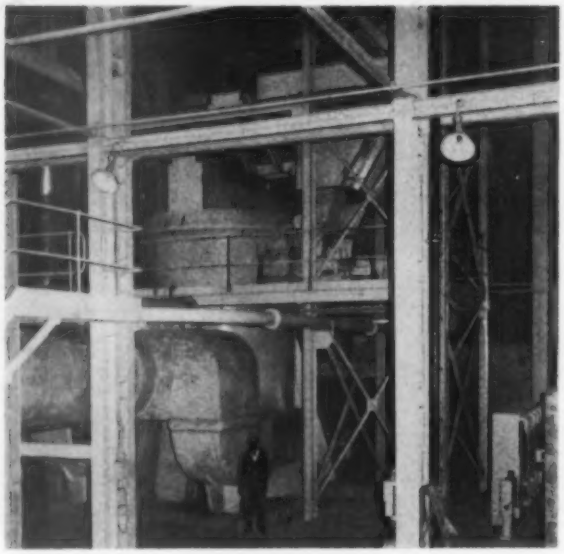
S-A STANDARD ROLLER TYPE HOLD-BACK . . . provides all of the same outstanding advantages with the exception of the Totally Enclosed Design. Ruggedly constructed . . . economical . . . stocked for immediate delivery.

OUTSTANDING ADVANTAGES:

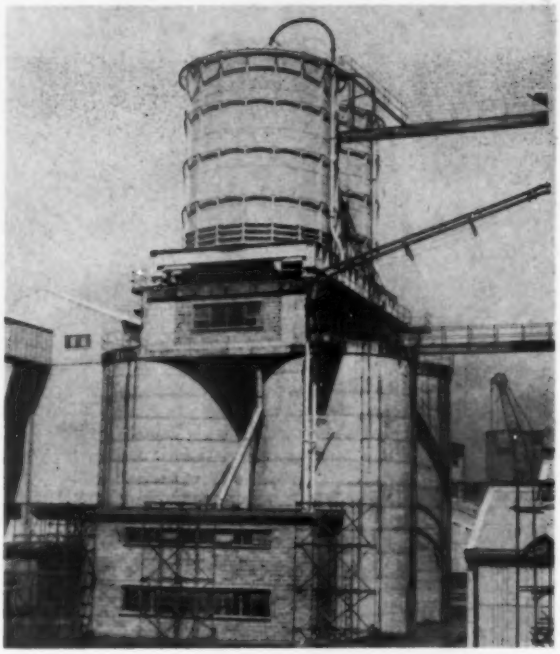
- Engages without shock . . . instantly holds . . . instantly releases when power is resumed.
- Eliminates flooding of feeder points . . . protects men and equipment.
- Balanced design . . . no ratchet to become fouled . . . quickly and easily installed . . . provides years of dependable, trouble-free operation . . . may be installed in any position!
- Totally enclosed design prevents entry of dust and dirt . . . economical to purchase, operate and maintain.
- Available in bore sizes from 1 7/16" to 12" . . . stocked for immediate delivery.

Write today for complete information . . . Request Catalog No. 557.

STANDARD PRODUCTS DIVISION
STEPHENS-ADAMSON MFG. CO.
20 Ridgeway Ave. Aurora, Illinois



The raw-material grinding and drying mill, with the hot air duct from the furnace at the left.



The raw material quadrant blending system and the storage silos.

grinding and collection groups as follows:

A 20-in. belt conveyor collects the materials from the following feeders in turn, and delivers them to the elevated feed hopper at the mill.

Shale is extracted from the bunker by a Newell apron feeder 36 in. wide on 12 ft. centers, having a variable speed drive.

Limestone is handled by two Locker Waytrol vibratory feeder units per mill, the output of each being variable between 5 and 35 t.p.h.

Iron oxide is extracted from the bunker by a smaller version of the shale apron feeder, which is 28 in. wide on 3 ft. 6 in. centers; in order to give the very slow speed required for the low tonnage, *viz.*, ⅓ to 2½ t.p.h. a ratchet mechanism has been incorporated in the drive.

The elevated feeder hopper, (gross capacity 34 ton) is supported at one side on hydraulic load cell, connected to a gauge calibrated to show the hopper contents in tons. Adjustable contacts are provided in the gauge to stop and start the four feeders as required to maintain the level of material within the hopper sufficiently high to insure adequate sealing of the feed to the mill against the high suction within. The load cell equipment is of Budenberg manufacture.

Materials are extracted from the feed hopper by twin vibratory feeders supplied with the mill, the amplitude of vibration being regulated from the suction conditions within the mill.

The MB. 22 mill, made by Pfeiffers to the design of Max Berz, Dipl. Ing., stands 28 ft. high to the top of its casing, and is 15 ft. diameter at its base, its gross weight being 125 tons. This mill is driven through a special Pekrun gearbox by a 500-hp. motor, and a 27-hp. motor drives the Whizzer classifier in the upper section of the machine. Motor-driven barring gear is also included for starting and maintenance purposes. Each MB. 22 mill is capable of drying and grinding 35 to 40 t.p.h. to 6 percent residue on 170 mesh.

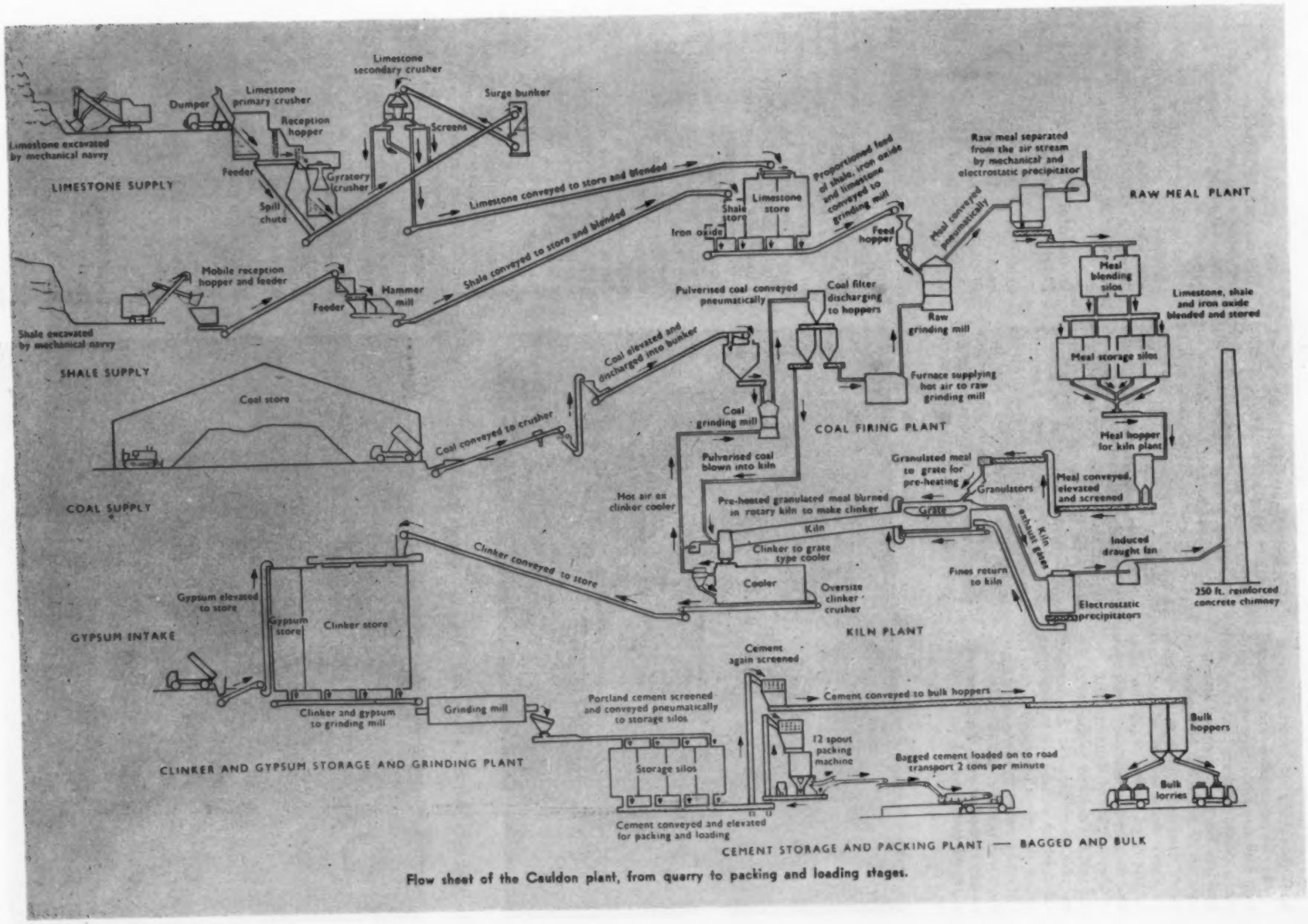
Hot air for each mill is provided by a separate pulverized-fuel-fired furnace, supplied by A. Herbert Limited; fine coal, produced in the kiln coal preparation plant, later described, is blown through approximately 270 ft. of 9-in. pipe to fire the furnace. Consumption is 2½ percent standard coal to clinker when grinding limestone at 5 percent moisture and shale at 20 percent.

The supply of hot air to the mill is automatically regulated in quantity and temperature; provision is also made for an emergency cold air bleed which automatically opens, should an excessive temperature be reached at the mill inlet.

The fine meal produced in the mill is drawn upwards through the integral classifier, which rejects the oversize, and the fines then pass to the Davidson mechanical pre-collector which, positioned immediately prior to the Sturtevant electrostatic precipitator, reduces the initial dust burden of 263 grains per cu. ft. to about one-fifth of that value. The combined unit is designed to handle 44,000 c.f.m. at 160 deg. F. and is under suction from the 350-hp. Aerofoil bladed centrifugal fan, supplied by Musgrave & Co. Ltd. The total resistance of the mill, collector, and ducting is about 30 in. w.g. The combined efficiency of the collector is 99.9 percent.

Raw Meal Blending, Storage The raw meal, falling into hoppers below the collectors of the two grinding units is conveyed by 25-in. screw conveyors to a single 13-in. Redler conveyor, the delivery head of which rises to feed the intake hopper of a 10-in. Fuller-Kinyon pump; this unit powered by a 70-hp. motor, delivers the meal *via* an 8-in. pipeline to the top of the blending-storage plant. A Fuller continuous sampler is included in this pipeline.

The raw meal blending and storage plant comprises a pair of welded steel blending silos, 29 ft. in diameter by 38 ft. 6 in. high, supported on special framework on top of a group of four reinforced concrete storage silos, each 29 ft. internal diameter by 37 ft. high. Each silo has a nominal capacity of 560 tons, representing the output of the two grinding units over



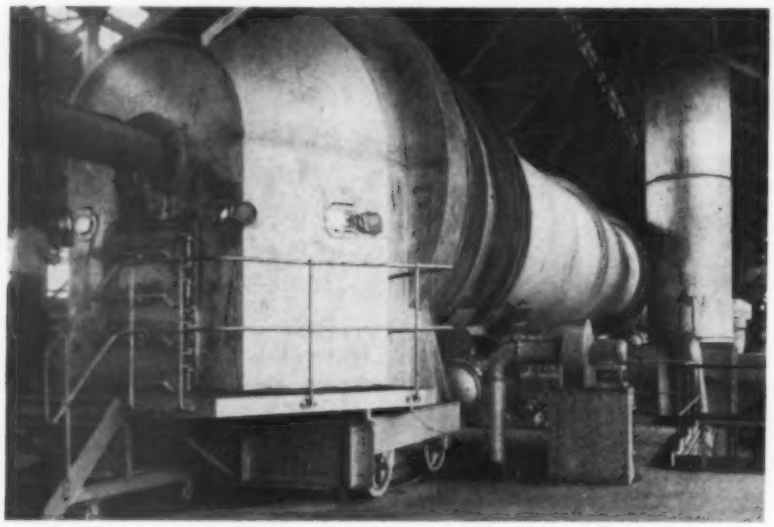
Flow sheet of the Cauldon plant, from quarry to packing and loading stages.

an 8-hour shift.

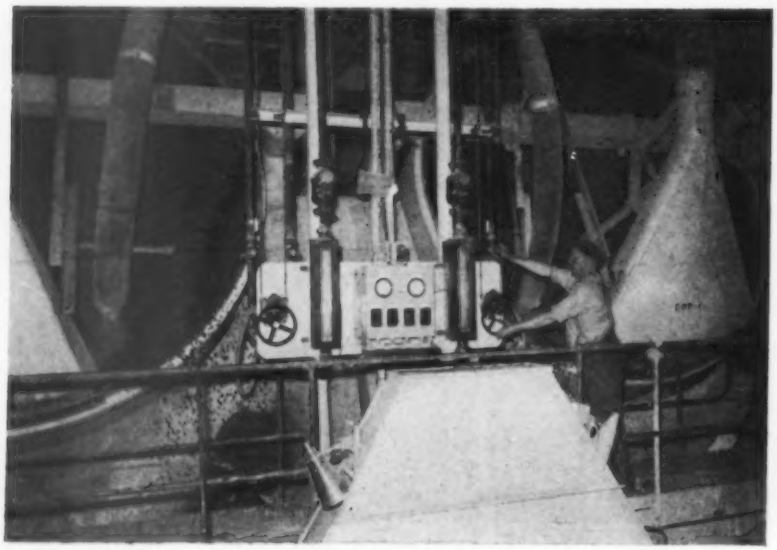
The blending silos are equipped with Fuller quadrant blending equipment, compressed air being supplied by Hick Hargreaves rotary compressor No. 6 and No. 11S. A set of four "strain gauge" type load cells, by Davy Bros. & United Ltd., are incorporated below each blending silo, to give a continuous indication of the weights of the contents.

Meal is delivered to the top of the two blending silos *via* a motorized valve which can be set to deliver to either silo, or alternatively, can be put into automatic operation to share the meal between the silos, by constantly changing over the delivery at a pre-selected interval.

After blending, the meal is discharged by a Fuller-Huron Airslide system to one or more of the storage silos below; these in turn are discharged as required by a further set of Airslides which deliver to two 10 in. Fuller-Kinyon pumps. Each has a separate 8-in. pipeline to the elevated meal hopper in the granulator building, and under normal conditions one pump is used on this duty with the other as standby; provision is also made for "re-circulation" of meal from these pumps to any of the six silos. Two No. 14 rotary compressors with 110-hp. motors supply air to these pumps. Continuous samplers are installed in the meal pipelines just after the pumps.



The front end of the 12-ft. 6-in. by 152-ft. rotary section of the kiln.



Two raw meal granulators or nodulizers.

The quadrant blending system, Airslides and Fuller-Kinyon pumping equipment are all supplied by Messrs. Constantin Engineers Limited.

For venting purposes, the two blending silos are linked to the storage silos, which in turn exhaust through a total of eight batteries of multi-stocking-type filters.

Granulator Plant This operation is housed in a 116-ft. high building at the south end of the kiln group. Apart from the single large sieving screw, all the equipment between the 350-ton capacity meal hopper and the feed chute of the grate is in duplicate, both sets being in continuous service to maintain the required output.

From each of the twin outlets of the kiln feed hopper, a twin screw extractor delivers to a 20-in. elevator which discharges into the sieving screw. The latter has an overflow Airslide back to the hopper, thus maintaining a constant head of material over the dual star feeders. These units have variable speed drives for accurate regulation of the feed rate, and each delivers to a vibratory conveyor of the "out of balance" motor type, which in turn discharges into one of two dish granulators. These have dishes 12 ft. in diameter by 3 ft. deep, the inclination of which may be varied over a wide range; scraper gear of the crank-operated oscillating type is included.

Water is supplied to each granulator by a separate pump, which is coupled to the variable speed drive of the star feeder; water is thereby delivered in direct proportion to the quantity of meal, but since these pumps are of the variable positive displacement type, the water/meal ratio may be varied as necessary to produce good nodules; about 12 percent moisture gives the best results. Rotameters are provided to give direct indication of flow rates.

A circular dust filter unit is installed in the granulator building to vent the hopper, elevators, granulators, etc.

All equipment in the above plant has been supplied by Polysius Limited.

Lepol Grate Plant The Lepol grate, 13 ft. wide by 71 ft. centers of head and tail shafts, is of the double-pass type and

is driven by a 17-hp. variable speed motor through a quadruple spur reduction gear.

Two similar induced-draft fans are included; these are of the Keith Blackman 80-in. H.E. type, each driven by a 100-hp. variable speed motor. The intermediate fan is located at the side of the grate, and draws the gases from the first pass through the set of six cyclones provided to extract the clinker dust, before returning the gases to the grate for the second pass. The final I.D. fan is located between the electrostatic precipitator and the chimney.

Dust from the cyclones, and throughs from the grate, are handled by a set of screw and dragchain conveyors which can deliver, under alternative arrangments, to the elevators at each end of the grate plant. One of these returns coarse material to the kiln feed chute; the other elevates the final material to join the meal at the boots of the two meal elevators.

The Lepol grate and its ancillaries were also supplied by Polysius Limited.

Kiln The rotary kiln is of all-welded construction by Vickers-Armstrongs (Engineers) Ltd. It is 152 ft. by 12 ft. 6 in. inside shell diameter, and is carried on three tires; the drive is located adjacent to the third tire, nearest the grate, the 90-hp. variable speed motor being coupled to a triple reduction spur gear box.

The firing hood, nose ring, and seal were provided by Polysius Ltd. along with their firing equipment (later described).

The guaranteed output of grate and kiln is 500 t.p.d. and the standard coal consumption to clinker 14 percent (663,000 B.t.u./barrel).

Kiln Gases The gases from the Lepol grate pass into a Sturtevant electrostatic dust precipitator. The reinforced concrete casing of this unit is divided longitudinally to provide two completely separate compartments, thus permitting maintenance of one as required without shutting down the kiln plant. Dust is conveyed by 12-in. screw conveyors from the twin collecting hoppers to a Redler conveyor, which discharges into the dust-handling system of the Lepol grate.

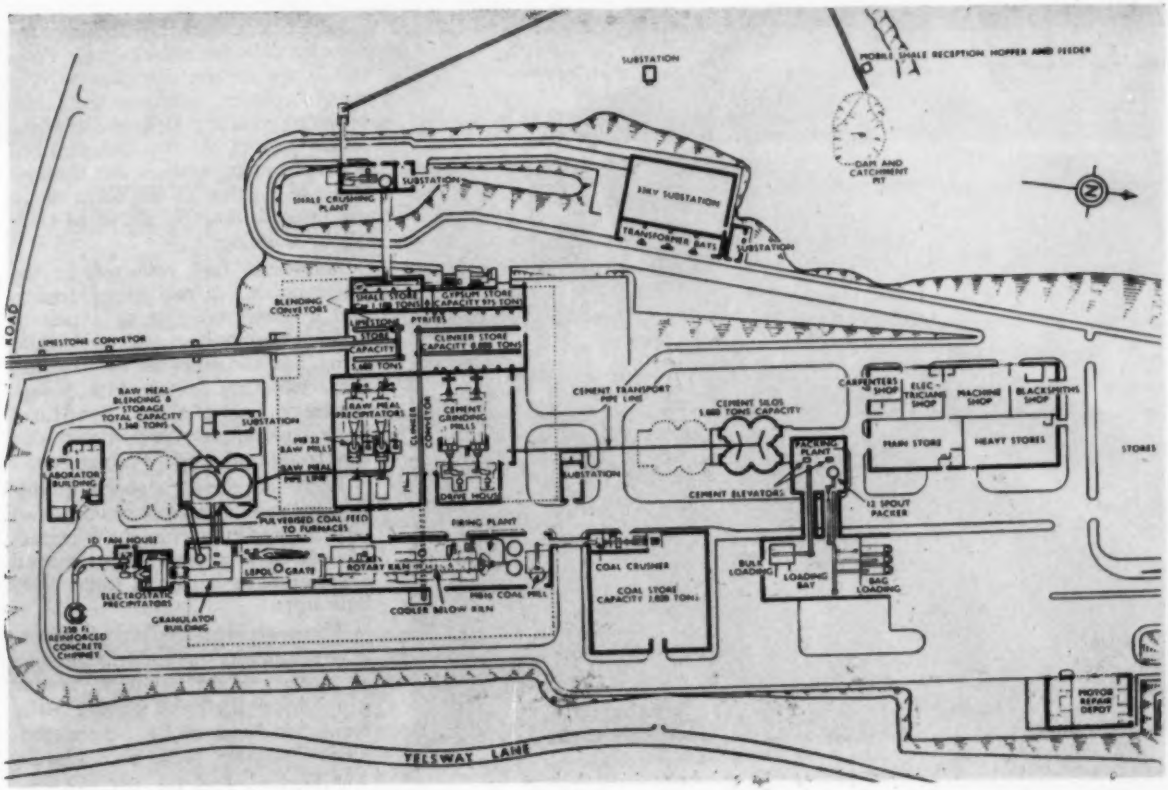
The precipitator is rated to handle 65,000 c.f.m. at 250 deg. F. A lining of blue bricks set in acid-resistant mortar has been incorporated to prolong the life of the casing.

A 250-ft. reinforced concrete stack has been constructed, suitable in design and location for a 3-kiln plant; the lining and top 15 ft. of the shaft are constructed of Accrington "Nori" bricks set in acid-resistant mortar.

Clinker Clinker is discharged from the kiln into a Fuller double pass grate cooler size 744 *i.e.*, 7 ft. wide by 44 ft. long. This cooler, together with its clinker breaker, has been manufactured under license by Vickers-Armstrongs (Engineers) Ltd. Two 65-in. Keith Blackman 14 EK fans are provided, one for cold air blowing and the other for recirculation of air for the second pass; each has a 70-hp. motor.

The cooler is capable of cooling 700 tons clinker per day down to a temperature of 170 deg. F.; the bed speed may be varied by regulating the speed of the 12-hp. variable speed motor driving the oscillating mechanism.

Clinker from the cooler discharge is conveyed by a dragchain conveyor which also collects the fines falling through the grate apertures; this conveyor delivers to the fully troughed catenary conveyor which for the major portion of its length rises at



The general plan of the plant at Cauldon. The quarry, not shown, is toward the left.

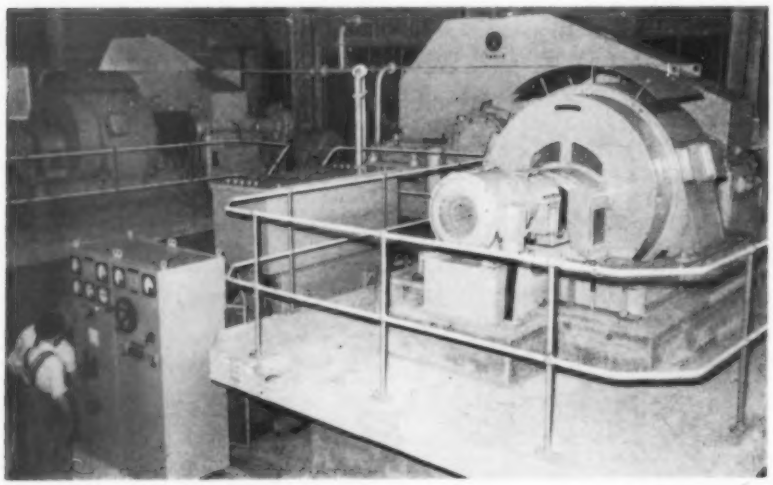
30 degrees to the horizontal, finally discharging into a pair of Redler conveyors distributing over the length of the clinker storage; gross capacity is 8,000 tons.

Coal Coal, delivered by truck, is dumped within the covered coal storage area, which has reinforced concrete walls and is designed to store 3,000 tons, bulldozed to 15 ft. deep. Coal is fed from storage to a ground level hopper by bulldozer, whence a 20-in, troughed belt conveyor feeds a 30- by 28-in Kennedy double-roll crusher, capable of crushing 60 t.p.h. down to ¾ in. A Boxmag overband-type magnetic separator is stationed over the belt just before the crusher to remove any tramp iron.

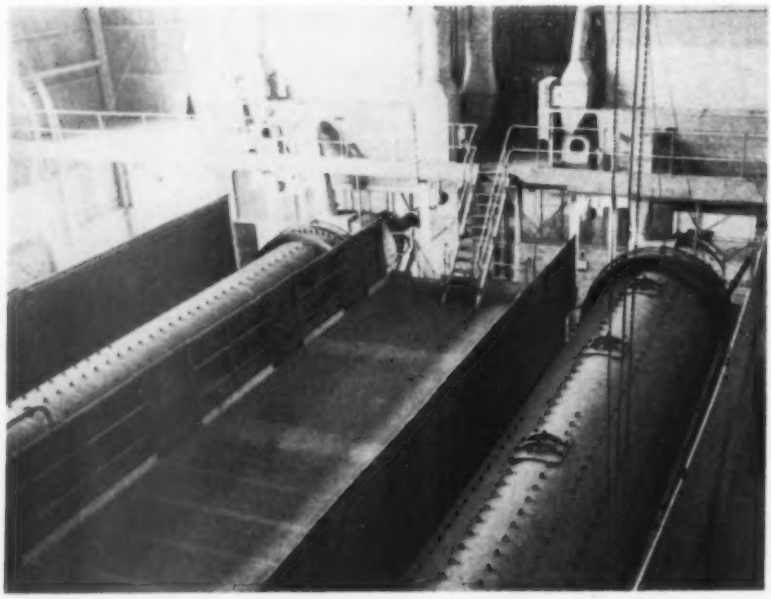
Crushed coal falls into the boot of a Perfect discharge-type bucket elevator, which delivers *via* a further 20-in. troughed belt and a 36-in. flat belt with knife gear, to the 250 ton capacity raw coal bunker.

This coal-handling plant was manufactured by Crushing & Screening Engineering Limited of Jarrow.

Coal is extracted from the raw coal bunker by a drag link-type feeder, driven by a 3-hp. motor through a hydraulic variable speed gear. This feeds the MB. 16 coal mill, made to the design of Mr. Berz by Messrs. V. K. W. Dusseldorf; this machine is a smaller edition of the MB 22 and weighs 19 tons. It does, however, differ in that the classifier is of the static type, rather than the whizzer type in the larger mill. The overall height of the MB. 16 is 17 ft., and its base diameter approximately 6 ft. Powered by a 100-hp. motor, the mill has rated output of 5½ t.p.h. at 12 percent on 170 mesh.



These two cement mill drives have 1,200-hp. motors and special gear reducers.



The two 8-ft. 4½-in. by 45-ft. cement-grinding mills and the servicing platform.

Hot air for the coal mill is drawn off from the port in the body of the Fuller cooler *via* a duct which also supplies the kiln's primary air to the "eye" of the firing fan. A cyclone is interposed to trap clinker dust. In order to maintain a satisfactory and constant temperature at the mill outlet, an automatically controlled cold air inlet is fitted to the duct, immediately prior to the mill.

The mill is, of course, airswept, the fines being drawn up into the filter plant at the top of the building under the suction of a 48-in. Keith Blackman H.E. fan handling 11,000 c.f.m. at 180 deg. F. and 33 in. w.g.

The filter plant consists of two circular 6-compartment units, with common inlet and outlet ducts. Each of the 12 compartments is isolated in turn, and the stockings are scavenged by heated clean air flowing in the reverse direction to normal. Explosion reliefs of the membrane type occupy all available space on the tops of the two casings, from which trunking extends out through the roof, so that in the event of an explosion, it may be dissipated clear of the building.

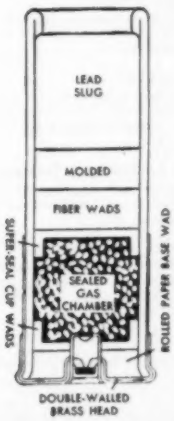
Pulverized fuel collected in the filters passes *via* two rotary feeders and a screw conveyor to a pair of 30-ton capacity hoppers, one for kiln firing, and the other for the raw mill furnaces. That for the kiln is supported on a set of three Elliott Load Cells to permit short period checks on coal consumption to be carried out.

Each of these hoppers is discharged into a smaller constant-level feed hopper by a twin-screw extractor, which is automatically stopped and started by a pair of Fuller level indicators.

The coal for the kiln is fed from its feed hopper into the firing pipe by a rotary feeder having a variable speed drive; the firing fan is a 54-in. Keith Blackman 8 EK., direct-coupled to a 50-hp. 1,450 r.p.m. motor.

Pulverized fuel for the two raw

RINGBLASTER with Western® ammunition smashes kiln rings faster...



Smash kiln rings faster—hit more accurately—get far better firing results from *your* kiln gun with Western ammo! Western Super-X 8-gauge ammo develops a smashing force greater than any shell. And, ballistics tests proved this shell is 10% more effective when used in the new RINGBLASTER kiln gun.

Super-X 8-gauge ammunition is made of a special alloy that assures deeper "keyway" penetration . . . faster kiln ring disintegration. Fewer shells are needed, and down time is cut to a *new* low.

Additionally, the RINGBLASTER, with its baffled muffler, gives operators a measure of sound safety never before possible.

"Terrific improvement!" . . . "Impressed with its quieter operation!" . . . "Should have been done before!" . . . these are typical of the many favorable comments made by new users of this improved kiln gun.

RINGBLASTER is the *only* kiln gun to come factory-equipped with a muffler. Write for new catalog.

RINGBLASTER Kiln Gun

FOR SHELLS, SERVICE OR EQUIPMENT CONTACT:
Ramset Fastening System
CLEVELAND 11, OHIO

Made by WINCHESTER-WESTERN DIVISION
OLIN MATHIESON CHEMICAL CORPORATION
EAST ALTON, ILLINOIS

12175-L Berea Road

Cleveland 11, Ohio

1958 Forecast

PIT and QUARRY

January, 1958
ANNUAL REVIEW
and FORECAST

The most valuable guide for your future planning in the pit and quarry industry

Aggregate Production Continues Climb
Federal Highway Program Under Way
Nonmetallics Maintain Vigorous Activity
1956 Tenth Consecutive Record Year

Pages reproduced from the January 1957 Annual Review and Forecast Issue.

The January issue is an all-out effort to provide basic market information in this the nation's basic industry.

Much of the information gathered for the Annual Review and Forecast Issue comes from a comprehensive annual survey of the industry. Production and equipment purchase plans of individual plants are tabulated, analyzed and reflected in the forecast for the industry.

It is another PIT AND QUARRY exclusive . . . an industry service project directed to both the administrative and production executive group in producer and processing plants of sand and gravel, cement, crushed stone, lime and other nonmetallic minerals.

Well planned, professionally executed features will contain vital, valuable market information and projections that will stimulate the buying appetites of thousands of readers.

Advertising-wise, the January Annual Review and Forecast Issue is a *must* for those manufacturers seeking to grow with this expanding industry.

Be sure you are adequately represented with your strongest sales story. The January issue will be kept and referred to for months to come. Send your space reservation today.

1957 Review — 1958 Forecast

Construction Review and Forecast
Conditions in the construction industry in 1957 and prospects for 1958 including volume, public and private construction, the highway construction picture, etc.

Cement Review and Forecast
A close-up look at production, shipments and value, cement supply, profits, prices and costs, 1957 capacity increase, long-range possibilities, industry problems, imports and exports, plant expansions, etc.

Aggregates Industries Review and Forecast
Hourly capacities, selling prices, wages, and outlook for Sand and Gravel, Crushed Stone, Agricultural Limestone, Slag, Lightweight Aggregates, etc.

Other Non-Metals Review and Forecast
Production figures, trends, vital statistics in relation to lime, gypsum, sulphur, fluorspar, phosphate, potash, feldspar, kyanite, graphite, mica, clays, asbestos, bauxite, talc, etc.

Plus—all regular editorial features and departments.

Plus—EXTRA DISTRIBUTION. Copies of the January issue will be distributed to all booths at the National Ready-Mix Concrete Association Show, National Sand and Gravel Association Show both at Conrad Hilton and Coliseum, Chicago, Feb. 10-13; the National Crushed Stone Association Show Conrad Hilton, Chicago, Feb. 16-19. This added circulation means opportune sales coverage at the time buying decisions are being made.

PIT and QUARRY
BPA 431 South Dearborn St., Chicago 5, Ill. NBP

EXTRA DISTRIBUTION • EXTRA READER INTEREST • NO EXTRA COST

mill furnaces is extracted from the feed hopper by Herbert-Redler feeders and blown to the firing nozzle by pressure fans.

Gypsum Gypsum is dumped from road vehicles into a receiving hopper from which a 24-in. belt feeder delivers to a 60 t.p.h. elevator; the latter discharges into the 1,170-ton capacity gypsum storage, which, as earlier stated, is served by the electric overhead travelling clamshell crane.

Cement Grinding Clinker and gypsum are extracted from the stores by belt feeders, those for clinker being rail-mounted so that they may each be positioned to draw from any of the three feed points; the materials are carried to the mill inlet on a 20-in. belt conveyor.

The two grinding mills are of Vickers Armstrong manufacture, having shells 45 ft. long by 8-ft. 4½-in. diameter. Lining and diaphragms are fitted to form four chambers, the total running weight of each mill being about 170 tons.

The mills are driven at 20.5 r.p.m. by 1200-hp. B.T.H. motors, *via* double-reduction helical gear boxes manufactured by Turbine Gears Limited. Each mill has an output of approximately 30 t.p.h. when grinding ordinary portland cement to B.S.S.

From each mill discharge, cement passes *via* Hum-mer vibratory screen, to a 7-in. Fuller-Kinyon pump, which delivers to the silos. The pumps have 70-hp. motors, and air is provided by two Hick Hargreaves No. 13 rotary compressors, each with a 90-hp. motor.

Each mill is vented by a dust collector of 5,000-c.f.m. capacity at 180 deg. F. Aquastat units are installed in the cooling water supply system to prevent scale formation on the mills.

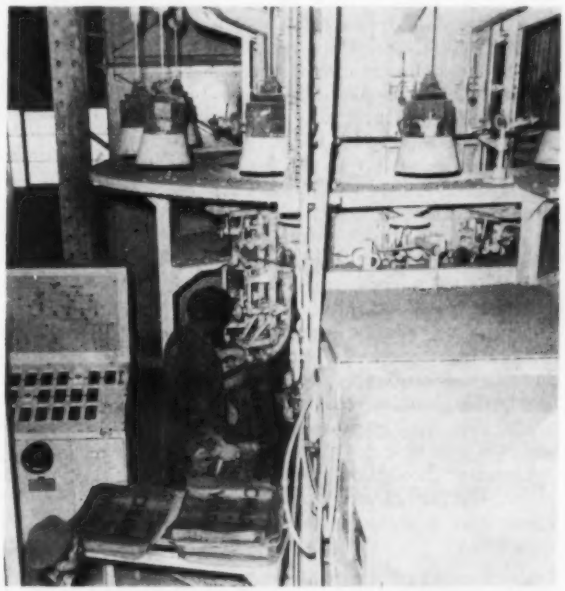
Cement Storage and Packing Each of the four reinforced concrete cement silos has a capacity of 1,250 tons; cement is extracted by Airslides, which deliver to two 24-in. screw conveyors. These, in turn, discharge to two elevators in the packer building, which is designed to house two F. L. Smidth Fluxo 12-spout packers. In the first instance, however, only one packer has been installed; the second elevator, therefore, is used for the bulk loading plant.

At the packing plant, the elevator delivers to the rotary screen, from which cement passes, *via* the pneumatic feeder, to the Fluxo 12-spout packer, which fills valved multiwall paper sacks at the rate of 120 t.p.h. A laminated conveyor takes the sacks from the packer to the 36-in. flat belt conveyor, which has throw-off knives to feed to three Boby retractable conveyors for truck loading.

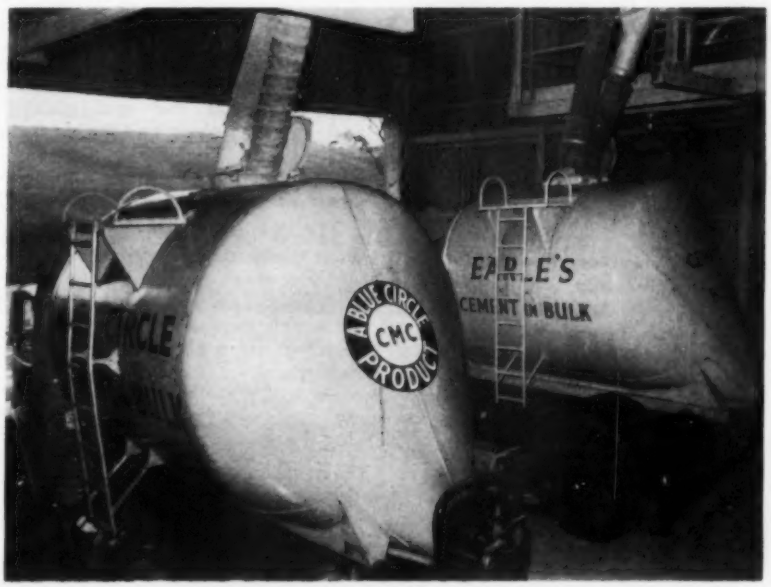
Provision has been made for dealing with broken bags; these are discharged over the end of the flat belt conveyor into a hopper, where the cement is separated from the paper and returned to the silos by a 3-in. Fuller-Kinyon pump.

A Darnley Taylor dust filter plant, capacity 6,800 c.f.m., vents the packer and its ancillaries, and a Sturtevant vacuum plant is provided with several suction points for general cleaning purposes.

Bulk cement from the second elevator in the packer building passes through the rotary screen and thence *via* a series of 24-in. screw conveyors to two 90-ton capacity bulk loading hoppers. Road vehicles are loaded



Cement is packed by this 12-spout machine. The plant control panel is at the left.



Bulk cement being loaded into pressurized tank trucks for delivery.

from these by means of Airslides, dust extraction being provided by a Spencer Halstead unit of 2,000 c.f.m. rating.

Power Supply and Distribution Power is taken from the National Grid at 33 kv. through two 4,000 kv.-a. transformers manufactured by Metropolitan Vickers Electric Co. Ltd. The installed horsepower of the plant as described above is 9,500, with an estimated maximum demand of 4,600 kv.-a.

The plant comprises four heavy load areas, *viz.*, limestone crushing plant, raw mills, kiln plant, and cement mills. Each of these has a 3.3-kv.-a. substation, housing h.t. switchgear for motors of 200 hp. and over, together with feeder circuit breakers for a total of six 750-kv.-a. 3,000/415 volt transformers and also 1. t. distribution boards.

All motors of up to 90 hp. are standardized and of Crompton Parkinson manufacture; larger motors are by English Electric, Metropolitan Vickers, and B.T.H., with the exception that all variable machines are Laurence Scott N-S type.

To a large extent, sequence control has been adopted to ensure correct starting sequences for machines in a group, and to reduce as far, as practicable, the consequences of failure of a machine.

Lighting throughout the works is 110 v., but for convenience the office block and laboratory are supplied with 230 v.

Instrumentation The essential instruments for the operation of the raw mill plant and kiln group have been centralized by incorporation in graphic panels, housed in pressurized cabins, situated respectively adjacent to the MB 22 mills, and on the kiln firing platform.

A further panel has also been located on the granulator floor to provide the operator at that station with the basic information he requires.

All panels, cabins, and instrumentation have been supplied by Hartons Installations Limited, who are also responsible for their installation.

Pneumatic power cylinders have been extensively used to provide remote control from the panels for dampers, motor speed regulators, and so on. Oil-free air for these is supplied by a pair of Williams & James twin cylinder compressors.

Other Buildings The two-story office block has concrete floors and a concrete roof, and is walled with precast concrete blocks, faced with Cullamix Tyrolean finish. The ground floor is largely occupied by the men's locker room and the canteen with its well equipped kitchen. The first floor houses executive, clerical, and technical offices.

A separate dispatch office with its 28-ton Avery road weighbridge stands at the plant entrance.

A one-story laboratory built of concrete blocks and having a concrete floor and roof, is located at the south end of the plant, adjacent to the raw meal blending plant and granulator building.

The full benefit of the experience of manufacturing in the 28 works in the Blue Circle Group, and the research which is constantly in progress at the Group's research department is reflected in the high quality of the cement produced at Cauldon. This quality is ensured by the continuous testing which is carried out throughout 24 hours of each day, at every stage of manufacture, in the plant laboratories.

A large 2-bay building houses the storage and workshops, each bay having a hand overhead travelling crane of 5-ton capacity. A comprehensive installation of steel cupboards, shelves, and racking is used. There is also a separate motor repair workshop with a covered greasing bay.

Provision for Expansion Although the plant was constructed as a single-kiln plant, adequate provision was made in the layout and design for future expansion to two or possibly three kilns.

Certain sections of the plant already have capacity adequate for a two-kiln plant, namely the shale-crushing plant, the coal-crushing and -handling plant, and the gypsum intake plant. The office, laboratory, workshops, and storage area similarly would not require extension.

The limestone-crushing and -handling plant would require only the addition of one feeder, one conveyor, and the second 5½-ft. cone crusher, for which provision has been made to meet the higher production requirements.

The packing plant building is designed for the second Fluxo packer, and space has been left and services planned to permit the doubling of the present size of the raw meal grinding, blending, storage, and cement grinding plant.

The entire Cauldon project was designed by Associated Portland Cement Manufacturers Limited and G. & T. Earle Ltd. Messrs. Oscar Faber & Partners were the civil engineering consultants.

Messrs. George Wimpey & Co. Limited were the main civil engineering contractors; Messrs. Bierrum & Partners Ltd., built the chimney and precipitators.

Mechanical erection, in the main, was carried out by the A.P.C.M. and G. & T. Earle Ltd., and electrical installations were by Frank Hancock (1939) Limited, Stoke-on-Trent. The electrical erection was done by G. & T. Earle Ltd.

Housing for Employees Additional housing is being provided for staff and workmen on an adjoining site, by the erection of two units of four and eight pairs of semi-detached houses. Two pairs of the semi-detached type are slightly smaller than the others, but all provide the same accommodations.

To conform with the local stone tradition, all the houses are built of "Davie" blocks, which consist of a facing of natural limestone backed with concrete. When bedded in lime mortar with a rubbed joint, the finished elevation cannot be distinguished from the local traditional mason-built rubble wall.

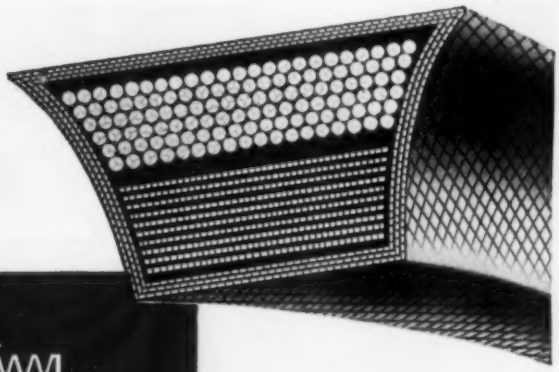
The roofs are covered with concrete slates, the color and texture being specially selected to blend with local traditional materials.

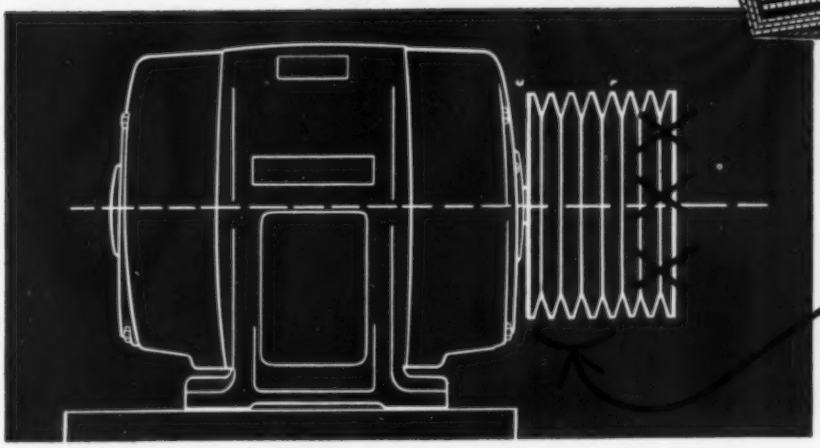
In view of the severe winter conditions normally experienced in this district, special consideration has been given to the insulation of these houses and to the protection of the plumbing systems against freezing by means of polythene piping. The main fireplace, which also heats the hot-water system, supplies an element of space heating for the upper floor of each house, *via* a hot-air duct discharging into the bedroom above.

General Everything possible is being done to preserve the amenities of the countryside. In this connection, the company is working closely with the Town & Country Planning Authority, and a landscaping scheme has been agreed upon which is being put into effect.

The output of the works is being handled, as far as sales and deliveries are concerned, by The Cement Marketing Company Ltd., and G. & T. Earle Ltd.

Get the same HP with fewer belts





5 Gates Super Vulco Ropes do the work of 7 standard V-belts

Cut sheave width and weight ... save in overall costs of your drive by using Gates *Super* Vulco Ropes with 40% more hp capacity.

5 Gates Super Vulco Ropes will do the work of 7 Standard V-belts. A Super Vulco Rope Drive delivers more HP per dollar invested than any standard V-belt drive.

Sheaves with fewer grooves cost less ... weigh less ... occupy less space. Your drive design is improved.

Helpful drive data is quickly available to you. Simply call your nearby Gates distributor for advice from a Gates V-belt specialist. Stocks carried in industrial centers throughout the world.

No other V-Belt has ALL these advantages

1. Flex-Weave Cover (U.S. Pat. 2519590)
A Gates exclusive: provides greater flexibility with far less stress on fabric. Cover wears longer ... increases belt life ... more power available to driven machine.

2. Concave Sidewalls (U.S. Pat. 1813698)
Concave sides (Fig. 1) increase belt life. As belt bends, concave sidewalls become straight, making uniform contact with sheave groove (Fig. 1-A). Uniform contact means less wear on sides of belt ... far longer belt life.

3. Tough, resilient Tensile Cords
Super strong resilient tensile cords provide 40% greater horsepower capacity ... easily absorb heavy shock loads ... reduce number of belts required, save weight and space.

4. High Electrical Conductivity
Built into Gates Super Vulco Ropes for safer drives (in explosive atmosphere).

5. Oil Heat, Weather Resistant
Special rubber compounds make Super Vulco Ropes highly resistant to heat, oil, and prolonged exposure to weather.

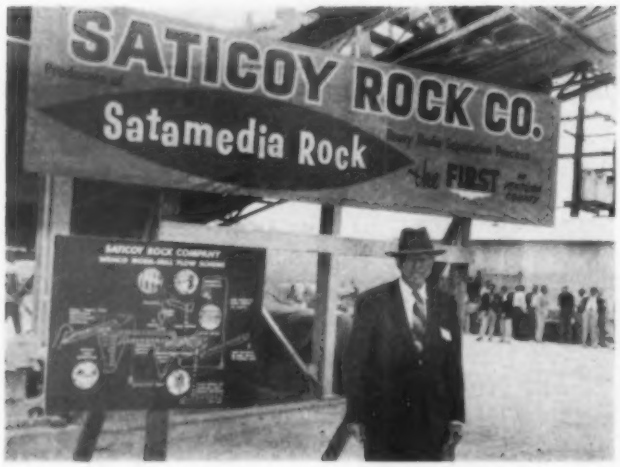
The Gates Rubber Company Denver, Colorado

Gates Distributors are in the Yellow Pages

The Mark of *Specialized* Research

TPA 277

Gates Super VULCO ROPE Drives



R. G. Griffin, production manager of Consolidated Rock Products Company, parent company of Saticoy Rock, now retired, who will serve on the staff of the Arthur E. Howland engineering firm in Los Angeles, as a consultant in pit and quarry plants. The sign and flow diagram were erected primarily for the open house.

Sink-Float Beneficiation Of Gravel Is Begun In Los Angeles Area

By HARRY F. UTLEY

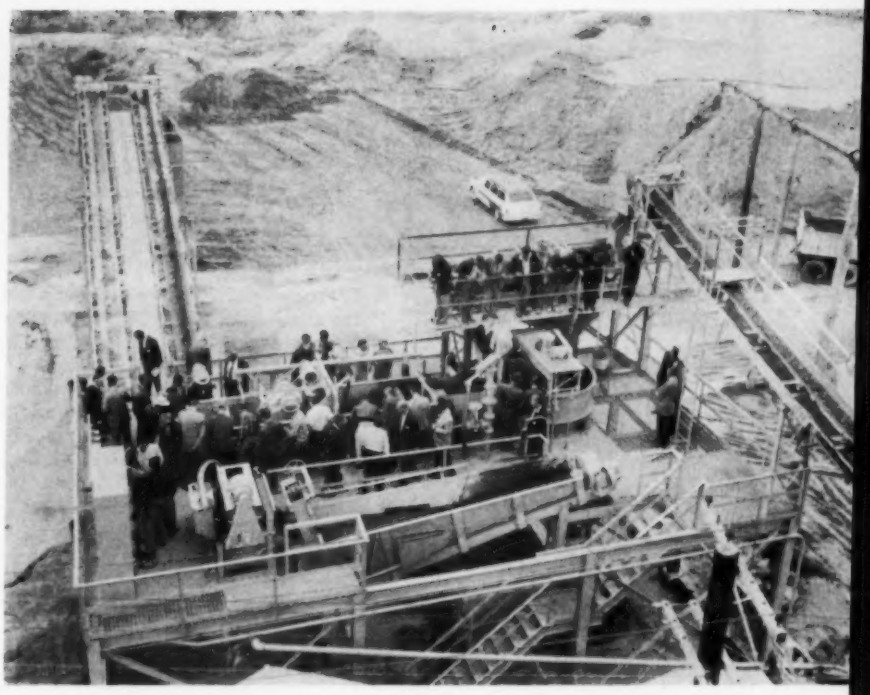
The spiral densifier in the newly installed heavy-media separation plant dewaters the dilute media in the reclamation circuit.

ANOTHER ON THE SPOT REPORT

SEVERAL hundred persons closely allied with the construction industry in southern California were the guests of Saticoy Rock Company on Saturday, October 19, 1957, at an open house at the plant. The event signalized the official start of production of Satamedia (specification) aggregates by heavy-media separation. The new equipment was recently installed at the plant, which is located near the coastal town of Saticoy, about 70 miles northwest of Los Angeles.

This H.M.S. facility is the first operation of its kind for the beneficiation of gravel in southern California. It consists of a Wemco No. 3 Mobil-Mill, which operates on a feed of about 60 t.p.h. of production-run washed and screened gravel in sizes within the range of ½ to 1½ in.

Saticoy Rock's new heavy-media separation plant being inspected by visitors. Here the interest is focused on the drainage and washing screen at the left of the separatory cone. Gravel to be beneficiated arrives via the conveyor at the right.



River gravels processed in this area contain considerable shale, chert, and other soft particles which are both unsound and inclined to be reactive. The Saticoy plant, as well as others in the vicinity, have long used soft-material eliminators or similar make-shifts in an attempt to disintegrate and wash away some of these undesired components.

Early this year, however, the Saticoy management decided to attack the problem objectively and invest in a modern sink-float system to insure production of the highest-grade aggregates. Test runs during September proved the wisdom of the decision; the equipment turned out a product safely within the rigid requirements of state and federal specifications for concrete that must withstand severe service and exposure.

A belt-conveyor links the bins of the aggregate plant proper with the new H.M.S. plant, and the gravel to be upgraded is rewashed and resized over a 3- by 10-ft. Symons screen just before it is fed into the 7-ft. Wemco cone-type separator. The separatory vessel contains the fluid media of pre-determined gravity, in this instance sp.gr. 2.40. Specific gravity of the feed itself averages out about 2.57, so the quality gravel (sp.gr. 2.61) sinks to the bottom of the cone, while the lighter chert and shale (sp.gr. 2.10) floats on the surface. The heavy-media used is a mixture of water and about equal parts of ferro-silicon and magnetite, so proportioned as to maintain the desired sp.gr. 2.40; the latter is checked at frequent intervals with a Marcy pulp-density scale.

In the pit this splitter or "sand machine" can reject varying proportions of excess sand to waste via the conveyor at the right. The belt at the left loads trucks with the pit-run in proper balance for delivery to the plant.

Sink gravel is carried by air-lift to a launder at the top of the cone. The float overflows the weir, and both products pass separately over a 4- by 16-ft. Allis-Chalmer longitudinally-divided No. 16-mesh single-deck screen for separate drainage and washing. A pair of belt-conveyors then carries them to a 2-compartment truck-loading bin.

Media recovery follows the more-or-less standardized Mobil-Mill circuit. Drained, undiluted media from the first screen section returns by pump directly to the cone. Dilute media, resulting from spray-washing the remaining media clinging to the "save" and "waste" products as they move along the screen, goes to a Dings magnetic separator and a Wemco spiral densifier for dewatering and finally to a demagnetizing coil before it returns to the reclaimed media sump for re-use.

Of the total volume of gravel fed into the H.M.S. circuit, about 82 percent is separated as sink and 18 percent as float. The up-graded Satamedia aggregate has an absorbtion rate of about 1.8, and loss in the sodium sulphate soundness test is in the range of 1 to 3 percent. Media loss has been calculated to about ½ lb. per ton of feed.

The Saticoy Rock Co. first began operating in 1922, digging its material then, as it still does today,

Norman G. Hallin, general manager, was formerly senior bridge engineer with the California Division of Highways.

from the bed of the Santa Clara River. In the thirties the plant was moved a mile or so downstream. It has been expanded and improved progessively until today it has a capacity of about 250 t.p.h. of washed and sized material. This capacity will be doubled within the next year or so, the management reports. Plans for the expansion already have been drafted.

Pit excavation is by dragline, and the truck haul to the plant receiving hopper averages about 1½ miles at present.

A rather interesting splitter device is used in the pit, where an excess of sand is often encountered, to permit wasting some of the fines during the loading operation and thus bring the gradation nearer the desired balance. This "sand machine," as it is called, is a portable assembly mounted on Athey track-type wheels; it can be moved about with very little effort as the dragline moves.

When the excavator is being used, it discharges into the sand-machine hopper while a following 4-in. grizzly and a Symons rod-deck screen operate to retain the gravel and any desired portion of the sand, which are then conveyor-loaded into the pit-to-plant trucks alongside. Another conveyor running in the opposite direction carries regulated amounts of excess sand away to waste into a worked-out pit area. The splitter can handle pit-run at the rate of 400 t.p.h. and can reject 50 percent or more of unwanted sand, at the same time keeping the trucks loaded and running on schedule.

The receiving hopper at the plant feeds to a 14- by 36-in. Pacific primary jaw-crusher; the minus 3-in. product travels up a 24-in. by 250-ft. belt-conveyor to the top of the high-level plant. Here the initial pass is over a 5- by 10-ft. triple-deck Stephens-Adamson screen. At this point, top-deck oversize is scalped off toward the "dry" (crushed-gravel) side, while the screen throughs are spray-washed and sized by two Symons screens. Each finished size drops to the appropriate storage bunker. The sand is processed and dewatered by a Conveyco wheel.

On the dry side an Allis-Chalmers Newhouse crusher makes a secondary reduction of the crushed gravel; and two subsequent reduction machines, an Allis-Chalmers No. 322 and a 3-ft. Symons cone, reduce the product still further to the desired finer crushed sizes. A sizable portion of the crushed material is in the

Above: The high-level concrete structure housing the crushing and screening equipment at the Saticoy plant. Units include primary and secondary crushers, plus two additional reduction machines for still finer sizes.

Right: The dual batching plant recently erected at Saticoy has a combined capacity of 250 cu. yd. of concrete hourly. Cement silos, located between the plant units, hold a total of 900 bbl.

"Outperforms any loader in its size class..."

"Our new HO 'PAYLOADER' *is an operator's machine,"* says L. J. Atkins, . . . *"it handles easily, has good brakes, plenty of power and excellent balance. It will outperform any loader in its size class!"*

Tractor-shovel performance like that is mighty important to an aggregate producer like T. J. Atkins and Company, of Jefferson, Indiana. Their machine is in constant use throughout the plant, loading out materials, general maintenance and stockpile care. It travels from job to job at speeds up to 24 mph. After a full years use, Mr. Atkins also reports: "Our 'PAYLOADER' has practically retired the four conveyor-type loaders previously used. It is nearly twice as fast working from the pile . . . it goes in fast and smooth and brings out heaped loads without excessive spillage."

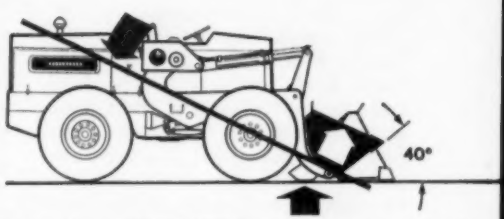
Operators and owners alike recognize the superior digging power of 4-wheel-drive "PAYLOADER" tractor-shovels. Because these models are equipped with such outstanding performance features as hydraulic load shock absorber, power-transfer differentials, "no-stop" power-shift transmission, planetary final drives, power-steering and 4-wheel power brakes, they outperform any wheeled tractor-shovel of comparable size. There is a "PAYLOADER" Distributor near you that is ready to prove this performance *on your work!* Why not call him today for a demonstration.

PAYLOADER®

MANUFACTURED BY

THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.

SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



Here's why a "PAYLOADER" outproduces any unit of comparable size — A tremendous pry-out force, almost equal to the weight of the machine, can be exerted at bucket digging edge by using the break-out pads on the bottom of the lifting arms as a ground support or fulcrum. Pads transfer load stresses to the ground, *not* the front axle.

THE FRANK G. HOUGH CO.
750 Sunnyside Ave., Libertyville, Ill.

Send more data on 4-wheel-drive "PAYLOADER" tractor-shovels as checked:

- ☐ **HO - 9,000 lb. Carry Cap. (1 to 4 cu. yd. buckets)**
- ☐ **HH - 7,000 lb. Carry Cap. (⅞ to 3½ cu. yd. buckets)**
- ☐ **HU - 5,000 lb. Carry Cap. (⅝ to 2½ cu. yd. buckets)**

Name.....

Title.....

Company.....

Street.....

City..... State.....

12-8-S

form of a minus No. 4 manufactured sand (known locally as "rock dust"), which has an excellent market. Classification of the crushed material, all processed in a dry condition, is by way of two 4- by 10-ft. Stephens-Adamson screens.

There are 12 separate truck-loading bin compartments at the lower plant level to receive the 10 standard end-products of the "wet" and "dry" sides. These include both concrete and plaster sands, 5 natural washed gravels, and 5 crushed products in sizes from 1½ in. down.

Besides regular and Satamedia aggregates production, the Saticoy firm also operates asphalt and ready-mixed concrete plants on the property, as well as a concrete-batching plant in nearby Ventura.

The asphalt plant, a 5,000-lb. capacity Madsen installation, was put in operation early in 1955. More recently, a new Conveyco high-output, dual batch plant began operating to replace an older setup.

The new batching facilities have the capacity to batch 2,000 cu. yd. of concrete per day into the truck-mixers. They consist of two separate and self-contained Conveyco plants served by two 450-bbl. cement-storage silos located between them. Each batch plant is completely automatic in operation. The overhead aggregate bin on each of the units has a capacity of 150 tons, one having 4 compartments and the other 5. A single 30-in. by 300-ft. conveyor served by a drive-over truck hopper keeps both bins supplied with aggregates; distribution is by way of a remote-controlled turnhead which can properly divert the materials into any of the 9 bin compartments.

The controlling interest in the Saticoy firm is owned by Consolidated Rock Products Company of Los Angeles. Quentin W. Best, president, and Robert Mitchell, secretary, are executive vice-president and president, respectively, of Consolidated. Norman G. Hallin, general manager of Saticoy Rock, assumed this post in January of 1957. For many years previously he was senior bridge engineer for the California Division of Highways.

Counter Cyclone Unit

(*From page* 96)

and fans. Soon after the first raw mix enters, the first clinker is discharged. The tons of raw mix in process are thus eliminated. A rotary must be operated at or near capacity. The tendency in cement plant design has been to replace small kilns by large kilns in the interest of fuel economy, and one-kiln plants are not uncommon.

With the clinkerer, good fuel economy is obtainable with a series of small-capacity units. This permits a wide range in the quantity produced during a day's operation. The replacement of small kilns by large kilns has always tended to decrease the uniformity of the product. For a given total plant capacity, if several kilns are producing clinker, there is more blending than if all the clinker is produced by one kiln. In the case of a large construction project some distance from adequate cement production facilities, a temporary plant often is suggested. A large rotary kiln makes this impracticable, but clinkerers could be used to advantage.

During the development of the clinkerer, only one disadvantage presented itself, but this seemed insurmountable. The unit apparently could be used only with the dry process. This would have meant that the cement industry's predominating procedure—the wet process—could not be employed, and that all its many advantages would be lost.

As sometimes happens in research, a solution of this problem came from an unexpected source. Independently of the clinkerer, the *nonaqueous liquid process* has been developed and patented. In this process, raw materials are ground and processed in the presence of a liquid other than water. When this liquid is vaporized and recovered, a dry raw mix results. The advantages of the wet process are retained and there is a major reduction in fuel consumption.

Canada Cement Co.

(*From page* 100)

is grinding approximately 320 bbl. per hour or 56 to 57 tons per hour of Type I cement. This gives a factor of 5.65 b.hp. per barrel for the mill only. The auxiliaries for one mill circuit are using 430 kw., giving an overall total power input to the department of 5.85 kw. per barrel. The circulating load has not exceeded 200 percent.

During last summer clinker was ground having a temperature up to 210 deg. F. The mill outlet temperature was controlled at 250 deg. F. by use of water up to 4.0 U.S. g.p.m. This has resulted in no appreciable change in the loss on ignition of the cement, and there has been no evidence of false or pre-initial set. Strength, setting times, finenesses—in fact, all quality requirements—have been easy to meet, and the mill has exceeded all operational forecasts.

It would appear that for very good economy reasons and product results, the very large grinding unit will be taking its place in the cement industry from this point onward.

It was realized that this mill department would be strange to the operators who were used to very old equipment; furthermore, it was appreciated that during the designing of the mill a large amount of information was accumulated which should be passed on in some fashion to the operators. A *Manual of Operation* was therefore written which contained diagrams, tables, and very simple descriptions. Colored sheets with special operation sequences and instructions on them were inserted.

Illustrated lectures were given, and discussions were undertaken with everyone concerned with this mill, from the superintendent to the millers, for the purpose of passing on this accumulated information. The management believes that this has paid off handsomely, particularly in the early days of operation, when the minor troubles that did develop were pin-pointed with speed and safety and rectified in short order. This procedure also broke down the idea that this was a complicated mill, and in reality it proved to be very simple.

Major equipment was supplied by F. L. Smidth & Co., the Sturtevant Mill Company, the Northern Blower Company, the Fuller Company, and Canadian General Electric. The design was done by the Engineering Department of the Canada Cement Company, the building construction by the Foundation Company of Canada, machinery erection by Provincial Engineering, and electrical installation by Canadian Comstock Company.

Mining Society

(*From page* 104)

cialization affects the pattern for a research organization, Mr. Ankeny pointed out. The speaker suggested that the organization should be comprised of closely related groups, each concerned with (specializing in) such separate functions as health and safety engineering, mining methods and practice, drilling and fragmentation research, ground stabilization and control, hydraulics and hydrology, transportation, ventilation, air conditioning, pneumatics, operation of mechanical and electrical devices, and others.

H. E. Uhland, Mulberry, Fla., metallurgist with International Minerals & Chemical Corp., was conference chairman; the chairman of the host Florida section of A.I.M.E. was Charles Chapman, Nichols, Fla., Virginia Carolina Chemical Corp.

Two Buffalo Slag Company Plants Win N.S.A. Safety Contest Honors

THE eighth annual Safety Competition sponsored by the National Slag Association and conducted by the Bureau of Mines, United States Department of the Interior, awarded top safety honors to the Woodlawn Plant No. 1, Buffalo Slag Company, Inc., at Woodlawn, N. Y., and the Morrisville Slag Plant, Warner Company, Morrisville, Pa. Bronze plaques, provided by PIT AND QUARRY magazine, were awarded to these plants for attaining the most outstanding safety records in the two groups of slag plants into which the competition is divided. A Certificate of Accomplishment in Safety was also presented by the Bureau of Mines to each employee and official of the winning operations as commendation for his help in achieving the outstanding safety record made by his plant during the year.

Group A—Plants operated 60,000 or more man-hours—Woodlawn Plant No. 1, operated by the Buffalo Slag Company, Incorporated, and located at Woodlawn, N. Y., was the trophy winner in the Class A or large-sized plant group. Its safety record was an injury-free year in which a total of 153,366 man-hours were worked. This was the first time that this plant has won the coveted PIT AND QUARRY trophy, although in 1953 and 1955 it ranked in second and third place, respectively. This plant was first enrolled in the 1950 contest, and during the eight years of competing it has been operated 781,473 man-hours with only 11 injuries to its employees. The frequency of injuries per 1,000,000 man-hours of exposure for this period was 14.076 and the severity of injuries per 1,000 man-hours for the same time was 0.381. Both of these rates were well below the 1956 rates for all other participants. The employees and officials of this plant deserve commendation for this outstanding record in safety. Six other plants in this area of the competition also had injury-free operations during the 1956 competition year.

Group B—Plants operated less than 60,000 man-hours—The Morrisville slag plant, in the first year of its participation in the contest, was awarded the PIT AND QUARRY plaque for winning highest safety honors in this group. This plant, operated by the Warner Company, is located at Morrisville, Pa. Having first enrolled in the 1956 competition, it was operated 59,477 man-hours without a lost-time disabling injury. The winning of the bronze plaque in the first year of enrollment clearly shows the determination of each employee and official to practice safety in each work-day. Fourteen other plants enrolled in this group also had injury-free records; the Morrisville slag plant with 59,477, the greatest number of man-hours, was declared the winner.

Injury-free plants—Of the 47 plants enrolled in competition there were 22 that were operated injury-free and these plants worked an aggregate of 1,313,695 man-hours. These injury-free man-hours accounted for 37.5 percent of the total man-hours worked at the 47 competing operations.

The following plants, excluding the trophy winners, were awarded Certificates of Achievement in Safety by the Bureau of Mines. They were operated 20,000 or more man-hours without a lost-time injury. In addition to these plants listed below, there were three plants with injury-free records that did not receive the certificate-awards because they did not meet the minimum requirements of operating 20,000 or more man-hours during the slag year.

Corrigan-McKinney plant, The Standard Slag Co., Cleveland, Ohio; 145,452 man-hours.

Republic plant, The Standard Slag Co., Youngstown, Ohio; 120,102 man-hours.

Foamed slag plant, Bethlehem Steel Co., Sparrows Point, Md.; 100,787 man-hours.

Mingo Junction plant, The Standard Slag Co., Mingo Junction, Ohio; 93,423 man-hours.

Bethlehem slag plant, Bethlehem Steel Co., Bethlehem, Pa.; 85,298 man-hours.

Detroit hard slag plant No. 1, Edward C. Levy Co., Detroit, Mich.; 67,144 man-hours.

Ashland plant, The Standard Slag Co., Ashland, Ky.; 57,528 man-hours.

Lordstown plant, The Standard Slag Co., Lordstown, Ohio; 48,954 man-hours.

East Toledo plant, The France Stone Co., Toledo, Ohio; 48,619 man-hours.

Wheatland plant, K. L. Dunbar Co., Wheatland, Pa.; 45,503 man-hours.

Benwood plant, The Standard Slag Co., Benwood, W. Va.; 40,432 man-hours.

South Chicago plant, N. D. Connelly Interests, South Chicago, Ill.; 39,935 man-hours.

Monessen plant, Duquesne Slag Products Company, Belle Vernon, Pa.; 38,373 man-hours.

Erie Plant No. 5, The Buffalo Slag Co., Incorporated, Erie, Pa.; 35,860 man-hours.

Colorado Fuel and Iron Corp., blast furnace pit, Arthur L. Allen Co., Pueblo, Colo.; 35,688 man-hours.

Brier Hill plant, The Standard Slag Co., Youngstown, Ohio; 31,659 man-hours.

Hubbard plant, The Standard Slag Co., Hubbard, Ohio; 30,348 man-hours.

Injury experience—The injury experience of the 47 competing plants in the 1956 National Slag Association Safety Competition revealed that the 1956 injury frequency of 15.693 was 20 percent higher than 13.054 of 1955, and 13 percent lower than the 17.747 rate for the 8-year overall frequency for the competition. The injury-severity rate of 6.954 for 1956 was likewise higher than that of 1955, being 39 percent higher than 4.259 for the preceding year and 26 percent higher than the eight-year overall severity of 5.128.

(*Continued on page* 156)

NEW GARDNER-DENVER "MOLE-DRIL"

(Trade-Mark)

hits the bit where it bites

This drill follows the bit right down through the rock. It cuts deep, big-bore holes . . . reduces drilling time and costs. The Gardner-Denver "Mole-Dril" adds more versatility to any rotary drilling rig.

DELIVERS MORE FOOT-POUNDS OF ENERGY . . .

to the bit than any other drill of its size. No power is lost regardless of drilling depth with this in-the-hole "Mole-Dril". There are no drill rods between drill and bit absorbing hammer shock.

DELIVERS AIR AT FULL PRESSURE FOR CLEANING

Hole cleaning ability is not completely dependent on exhaust air from drill. A separate air stream flows directly through bit at full line pressure to keep cutting face clean. The drill has up-cast exhaust air ports to give cuttings an added boost.

ONLY 3 MOVING PARTS

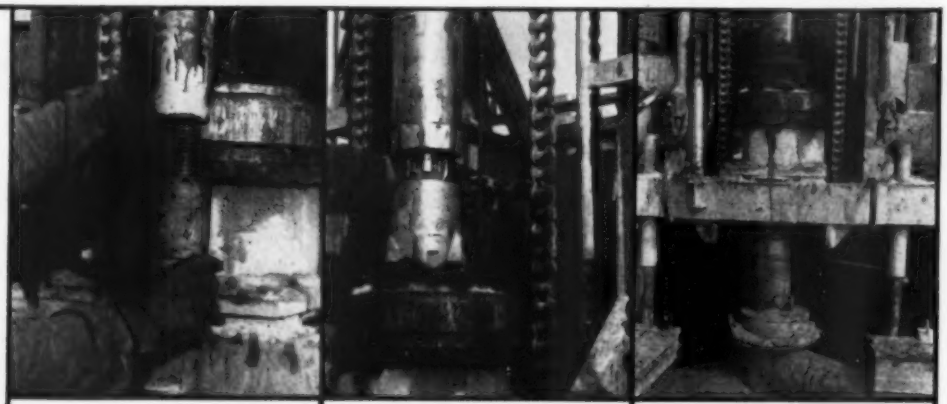
Rugged, simple construction delivers more work and less trouble. There are only nine major parts in the entire drill.

Two sizes available—here are the condensed specifications

	diameter	length	weight	recommended bit size
Model AM6	5¾"	38.6	200 lb.	6½"
Model AM4	4"	35.6	98 lb.	4¾"

Get the most out of your rotary drilling rig . . . save money . . . drill faster . . . get the new Gardner-Denver "Mole-Dril"

Patent Pending



Drill screws directly to standard drill pipe . . .

Bit screws directly on to drill tappet . . .

and down they go

ENGINEERING FORESIGHT—PROVED ON THE JOB
IN GENERAL INDUSTRY, CONSTRUCTION, PETROLEUM AND MINING

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

More Information, Please

Use the prepaid postcard to get this literature or additional details about new equipment and products reported elsewhere in this issue.

THE MICRO SWITCH PLUG-IN LIMIT is covered in Bulletin 20, published by *Micro-Switch, Div. of Minneapolis-Honeywell Regulator Co.* A complete description of the switch, mounting information, drawings, and photographs are included. (1)

A NEW ELEMENT IN ROTARY KILN DESIGN in which rollers, girth gear and gear train, and positive thrust mechanism have been integrated in a sealed enclosure has been developed by the *Vulcan Iron Works.* A brochure illustrating the new kiln is offered. (2)

MODEL CR-35 CRANE-EXCAVATOR is featured in an illustrated bulletin available from the *Schield Bantam Company.* Included are specifications, features, operating data, and capacities of the ⅜-cu. yd., 7-ton model. (3)

THE CLEVELAND SPEED VARIATOR is described in Booklet No. K-200, released by *The Cleveland Worm & Gear Company.* Engineering information, including sectional views, dimensions, and capacity ratings, is provided. (4)

DRAVO SCHENCK VIBRATING SCREENS, feeders, and conveyors are featured in *Dravo Corporation's* Bulletin No. 1475. Dravo is licensed by the Carl Schenck Co. of Germany to manufacture and market its complete line of vibrating equipment. (5)

SYMONS ROD DECK SCREENS, available in 10 sizes ranging from 3 ft. to 6 ft. in width and 6 ft. to 10 ft. in length, are described in a new 8-page bulletin published by the *Nordberg Manufacturing Company.* (6)

BROOKS E. P. LUBRICANTS are featured in a new brochure offered by the *Brooks Oil Company.* The literature describes a wide range of difficult lubrication jobs, and explains the use of Brooks E. P. products in solving severe applications. (7)

ACCO SLING CHAINS are discussed in Bulletin DH-101, available from the *American Chain Div., American Chain & Cable Co., Inc.* Featured is a listing of the 7 main points to consider when ordering sling chains. (8)

PHYSICAL PROPERTIES and conforming specifications for magnesium and aluminim alloys are listed in a catalog issued by the *Wellman Bronze and Aluminum Co.* Listings include alloys for sand castings, permanent mold, and rare earth alloys. (9)

ARMORITE, a rubber compound which provides resistance to abrasion, is presented in a catalog sheet published by *B. F. Goodrich Industrial Products Co.* Typical applications, specifications, and installation instructions are given. (10)

LUKENS STEEL COMPANY has prepared a 28-page booklet which provides detailed information on Lukens T-1 steel, a material which features rugged resistance to abrasive impact, ready workability, and sub-zero toughness. (11)

WORM GEAR SPEED REDUCERS are described in a booklet released by *The*

FIRST CLASS
PERMIT NO. 44
CHICAGO, ILL.

BUSINESS REPLY CARD
No Postage Stamp Necessary if mailed in the United States

—POSTAGE WILL BE PAID BY—

Pit and Quarry Publications

431 South Dearborn Street

CHICAGO 5, ILL., U.S.A.

DECEMBER, 1957

Please send more information on circled items described in this issue.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72								

In addition I would like information on:

_____

Name _____ **Title** _____

Company _____

Address _____

City _____ **Zone** _____ **State** _____

More Information, Please

Use the prepaid postcard to get this literature or additional details about new equipment and products reported elsewhere in this issue.

Jones Machinery Div., Hewitt-Robins, Inc. Drawings and specification tables show designs and ratings for the many standard units available. **(12)**

A MANGANAL WALL CHART containing pertinent information for use in welding shops working with manganal-nickel steel has been prepared by the *Stulz-Sickles Co.* The chart is helpful in determining the replacement of metal worn away by impact or abrasion. 23 sizes of Manganal wedge bars are pictured in actual size. Complete dimensions and estimated weights are included. **(13)**

OXYGEN ANALYSIS AND RECORDING EQUIPMENT for rotary kilns is described in a data sheet published by the *Leeds and Northrup Co.* Included are photos and diagrams illustrating details of the system and its installation. **(14)**

ABRASION RESISTING STEEL is described in a revised bulletin prepared by *Joseph T. Ryerson & Son, Inc.* Included is information on fabrication and heat treatment, along with performance records and illustrations of applications. **(15)**

BULLETIN E-208 describes *Davey Compressor Company's* line of mobile machine shops. Illustrated with photos and blueprints of typical shops, the leaflet describes truck-mounted units designed to meet all needs of users operating over extensive areas. **(16)**

MOLY-SULFIDE IN THE SHOP – IN THE FIELD is the title of a booklet containing application data for Moly-sulfide, a lubricant made by the *Climax Molybdenum Company.* **(17)**

PNEUMATIC CONVEYING SYSTEMS are discussed in a bulletin issued by *The Spencer Turbine Company.* Illustrations depict applications. Diagrams show a typical stationary and a typical portable system. Approximate capacities are included. **(18)**

VIBRATING SCREENS manufactured by the *Deister Machine Company* are illustrated in Bulletin No. 57. Details of each of the four basic models are included, in addition to an explanation of the opposed elliptical throw action which controls the movement of the material. **(19)**

AN ALL ANTI-FRICTION BEARING JAW CRUSHER manufactured by the *Denver Equipment Company* is featured in a new illustrated bulletin containing dimensions, features, and diagrams. **(20)**

LECCO VIB VIBRATING CONVEYORS are discussed in a bulletin released by the *Lecco Machinery and Engineering Company. Construction* features are illustrated and described. Installation photos are included. **(21)**

CENTRIFUGAL PUMPS made by the *Linatex Corporation of America* for the handling of abrasive materials are discussed in a catalog which provides information on pump selection, maintenance, and operation, as well as dimensions, capacities, and engineering data. **(22)**

DECEMBER, 1957

Please send more information on circled items described in this issue.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72								

In addition I would like information on:

_____

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

FIRST CLASS
PERMIT NO. 44
CHICAGO, ILL.

BUSINESS REPLY CARD
No Postage Stamp Necessary if mailed in the United States

—POSTAGE WILL BE PAID BY—

Pit and Quarry Publications

431 South Dearborn Street

CHICAGO 5, ILL., U.S.A.

MOVING A MOUNTAIN INTO A LAKE

25 million tons of gravel ride on SKF-equipped conveyors

In one of the largest earth-moving projects ever undertaken, a 13 mile dry-land roadbed is being built across the Great Salt Lake for the Southern Pacific Railroad. The construction company is using over 2 miles of Hewitt-Robins belt conveyors to transport 25 million tons of gravel into the lake for roadbed foundation.

Operating at speeds up to 850 feet per minute, this conveyor system delivers 75,000 tons of gravel per day.

Naturally, all components of this tremendous conveying system had to be chosen for rugged dependability, thus Hewitt-Robins selected 226 SKF (Type SAF) Pillow Blocks and Bearings for this application.

There were two major reasons for this choice: a) The SAF Pillow Block is available with the "Type C" Spherical Roller Bearing which provides up to 50% more capacity than other type sphericals; b) the SAF's Triple Seal which effectively seals dirt out of the housing and also retains lubricant.

No matter what your application, remember *only* SKF offers all types of anti-friction bearings, and a complete line of pillow blocks and flanged mountings. Remember, too, that an SKF field engineer is always ready to assist you in putting the right bearing in the right place. For further information consult your local SKF district sales office.

7781

SKF®

EVERY TYPE—EVERY USE

Spherical, Cylindrical, Ball, and "Tyson" Tapered Roller Bearings

*Reg. U.S. Pat. Off.

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

N.S.G.A. Safety Contest Winners Cited in Third Annual Event

AN ANALYSIS of the results of the 1957 National Sand and Gravel Association safety contest has been completed, and results have been determined. This is the third annual safety contest conducted by the association and covers the period from July 1, 1956, to June 30, 1957.

Class A—The winning plant for the second consecutive year in Class A competition (plants producing more than 500,000 tons of sand and gravel during the contest period) is the Van Sciver Plant of the Warner Company, Philadelphia, Pa., which operated without a single injury.

Twenty-two plants entered in the Class A competition had accident-free records. Following the policy established by the N.S.G.A. Safety Committee, the plant with the greatest combined total of tons of sand and gravel produced and man-hours worked receives the highest rating in the case of identical scores. On this basis, the Van Sciver Plant is the winner of the Class A competition. Certificates of Achievement in Safety will be awarded to the following plants with accident-free records enrolled in the Class A competition:

American Aggregate Corp., Greenville, Ohio, Columbus Grandview Ave., plant.
Becker County Sand & Gravel Co., Cheraw, S. C., Lillington, N. C., plant.
Harry T. Campbell Sons' Corp., Towson, Md., White Marsh plant.
Consolidated Rock Products Co., Los Angeles, Calif., Azusa plant No. 10, Claremont plant No. 11, Hewitt plant No. 3, and Sun Valley plant No. 2.
Consumers Company, Chicago, Ill., Crystal Lake plant and Dousman, Wis., plant.
Flint Sand & Gravel Co., New Orleans, La., Bluff Creek plant.
Material Service Corp., Chicago, Ill., Lockport plant and Morris plant.
Pacific Cement & Aggregates, Inc., San Francisco, Calif., Brisbane plant No. 130, Centerville plant No. 106, Clayton plant No. 135, and Eliot plant No. 104.
J. L. Shiely Co., Saint Paul, Minn., Grey Cloud plant.
Texas Construction Material Co., Houston, Alleyton plant No. 23 and Eagle Lake plant.
Western Indiana Gravel Co., Lafayette, Ind., Lafayette plant.
Winter Brothers Material Co., Kirkwood, Mo., Kirkwood plant.

Class B—Thirty-two plants entered in the Class B competition (plants producing between 200,000 and 500,000 tons of sand and gravel during the contest period) had accident-free records. The Hamilton (Symmes) plant of the American Aggregates Corp., Greenville, Ohio, which has the greatest combined total of tons of sand and gravel produced and man-hours worked among these accident-free plants, will be awarded the Class B trophy. Certificates of Achievement in Safety will be awarded to the following plants:

Acme Materials Co., Phoenix, Ariz., Phoenix plant.
American Aggregates Corp., Greenville, Ohio, Fort Jefferson plant.
Baton Rouge Sand & Gravel Co., Inc., Baton Rouge, La., Baton Rouge plant.
Brooks Sand & Gravel Co., Kingsport, Tenn., Erwin plant.
Buffalo Slag Co., Inc., Buffalo, N. Y., Franklinville plant F.
Consolidated Rock Products Co., Los Angeles, Calif., Sierra plant No. 19.
D'Addario Sand & Gravel Co., Bridgeport, Conn., Newton and Oxford plants.
Dallas Sand & Gravel Co., Inc., Selma, Ala., Plantersville plant.
L. G. Everist, Inc., Sioux Falls, S. D., Hawarden, Iowa, plant.
John M. Ferry, Glendale, Calif., Littlerock plant.
Greenville Gravel Co., Greenville, Miss., Greenville plant.
Hartland Sand & Gravel Co., Hartland, Wis., Hartland plant.
Hause Gravel Co., Asbury Park, N. J., Allenwood plant.
Henry J. Kaiser Co., Oakland, Calif., Olympia plant.
Edw. Lutz Sand & Gravel Co., Inc., Milwaukee, Wis., Sussex-Merton plant.
Lyman-Richey Sand & Gravel Corp., Omaha, Nebr., Cullom plant, Fremont plant, LaPlatte railroad plant, LaPlatte truck plant, and Valley plant.
Massaponax Sand & Gravel Corp., Fredericksburg, Va., Fredericksburg plant.
Material Service Corp., Chicago, Ill., Cayuga, Ind., plant.
Memphis Stone & Gravel Co., Memphis, Tenn., Airways plant and Camden plant.
Pacific Cement & Aggregates, Inc., San Francisco, Calif., Lemon Cove plant No. 133.
Pine Bluff Sand & Gravel Co., Pine Bluff, Ark., Pine Bluff plant.
Shippingport Sand & Gravel Co., Youngstown, Ohio, Shippingport plant.
The Rubber City Sand & Gravel Co., Akron, Ohio, Knight plant.
Western Indiana Gravel Co., Lafayette, Ind., Leesburg plant, South Bend plant
Western Sand & Gravel Co., Lincoln, Nebr., South Bend plant.

Class C—Fifty-six plants entered in the Class C competition (plants producing less than 200,000 tons of sand and gravel during the contest period) had accident-free records. The Ramsey plant of McKee Bros., Inc., Ramsey, N. J., will be awarded the Class C trophy because it had the largest combined total of tons of sand and gravel produced and man-hours worked among these 56 plants. Certificates of Achievement in Safety will be awarded the following plants:

American Aggregates Corp., Greenville, Ohio, South Dayton plant.
Associated Sand & Gravel Co., Everett, Wash., Everett plant.
Becker County Sand & Gravel Co., Cheraw, S. C., Marion, N. C. plant.
Berkshire Gravel, Inc., Pittsfield, Mass., Pittsfield plant.
Brewer & Brewer Sons, Inc., Chillicothe, Ohio, Chillicothe plant.
Buffalo Slag Co., Inc., Buffalo, N. Y., Alfred Station plant A. S., Allegany plant A, and Cohocton plant C.
Casey Stone Co., Casey, Ill., Greenup gravel plant.
Cemstone Products Co., St. Paul, Minn., Lakeland plant.
Concrete Materials Co., Cedar Rapids, Iowa, Booneville plant, Eddyville plant, and Waterloo plant.
Concrete Materials & Construction Co., Cedar Rapids, Iowa., Cedar Rapids plant and Marshalltown plant.
Consumers Company, Chicago, Ill., Dunes Park, Ind., Dept. 376, Hales Corner, Wis., Dept. 307, and Wadsworth, Ill., Dept. 305.
Davon Inc., Columbus, Ohio, Basic Construction Materials Div. plant.
Decatur Sand & Gravel Co., Decatur, Ill., Decatur plant.
Eastern Rock Products, Inc., Utica, N. Y., Boonville plant No. 1.
M. T. Epling Co., Gallipolis, Ohio, Gallipolis plant.
Gasport Sand & Gravel Co., Inc., Lockport, N. Y., Lockport plant.
Hampshire Sand & Gravel Co., Westhampton, Mass., Westhampton plant.
Frederick V. Lawrence, Inc., Falmouth, Mass., Falmouth plant.
Lea County Sand & Gravel, Inc., Eunice, N. M., Eunice plant.
Lorain Elyria Sand Co., Lorain, Ohio, Lorain plant.
Lyman-Richey Sand & Gravel Corp., Omaha, Nebr., Bridgeport plant and Columbus plant.
McGrath Sand & Gravel Co., Inc., Lincoln, Ill., Bloomington plant.
Manning & Locklin Gravel Co., Northville, Mich., Northville plant.
Mapco Sand & Gravel Co., Minneapolis, Minn., Minneapolis plant.
Memphis Stone & Gravel Co., Memphis, Tenn., Harrison plant, Love, Miss., plant, Portable crusher plant No. 2, and Raleigh plant.
Mobley Construction Co., Inc., Morrilton, Ark., Dardanelle plant.
Mount Vernon Sand & Gravel Co., Mount Vernon, Wash., Oak Harbor plant, and Samish plant.
Muskogee Materials Co., Muskogee, Okla., Chase plant No. 1.

Nathan Oaks & Sons, Inc., Oaks Corners, N. Y., Oaks Corners plant.

Pacific Cement & Aggregates, Inc., San Francisco, Calif., Lapis-Prattco plant No. 109 and No. 110, Olympia plant No. 125, and Yolo plant No. 131.

Ray Industries, Inc., Oxford, Mich., Oxford plant.

Riverside Gravel, Bismarck, N. D., Bismarck plant.

Rock River Ready Mix, Dixon, Ill., Dixon plant.

C. W. Shirey Co., Waterloo, Iowa, Waterloo plant.

Edward Sidebotham & Son, Inc., Wilmington, Calif., Wilmington plant.

Tionesta Sand & Gravel Inc., Hawthorn, Pa., Hawthorn plant.

Clarence Waterfall Co., Inc., Ogden, Utah, South Weber plant.

Waverly Gravel & Tile Co., Shell Rock, Iowa, Shell Rock plant.

The Windsor Building Supplies Co., Inc., Newburgh, N. Y., Plum Point plant.

Western Indiana Gravel Co., Lafayette, Ind., Anderson plant and Montezuma plant.

Rock Products trophies will be presented to the three winning plants at the Chicago convention next February. Certificates of Achievement will be mailed to accident-free plants which did not win a trophy. All production and distribution employees of the three trophy-winning plants will be awarded Certificates of Accomplishment in Safety.

This year 224 plants were enrolled by 138 member companies, the greatest participation in the history of the contest. The 1956 contest, which established the previous all-time high for participation, included participation of 222 plants of 126 member companies.

1956 Annual Lime Report Shows 1% Increase Over '55

The output of lime in 1956, which increased 1 percent over 1955, reached an all-time high of over 10,500,000 tons, according to reports of producers to the U. S. Bureau of Mines. However, the gain was entirely in the refractory (dead-burned dolomite) category as losses were registered in all of the other major classifications.

Lime for agriculture declined 17 percent, building lime 8 percent, and chemical and industrial lime 1 percent. Open-market sales of about 9,000,000 tons gained 1 percent over 1955. Of the total sold or used, 56 percent was in the form of quicklime, 21 percent hydrated lime, and 23 percent dead-burned dolomite.

Lime Sold or Used by Producers in the United States[1], 1955-56, by Types and Major Uses

	1955 Sold	1955 Used	1955 Total	1956 Sold	1956 Used	1956 Total
By type:						
Quicklime	6,916,688	1,325,487	8,242,175	7,047,079	1,343,970	8,391,049
Hydrated lime	2,013,115	224,638	2,237,753	1,957,060	229,187	2,186,247
Total lime	8,929,803	1,550,125	10,479,928	9,004,139	1,573,157	10,577,296
By use:						
Agricultural:						
Quicklime	116,428	1,125	117,553	96,049	80	96,129
Hydrated lime	187,826	38	187,864	155,857	49	155,906
Total	304,254	1,163	305,417	251,906	129	252,035
Building:						
Quicklime	176,612	54,973	231,585	123,918	54,890	178,808
Hydrated lime	1,056,052	22,137	1,078,189	1,009,465	14,732	1,024,197
Total	1,232,664	77,110	1,309,774	1,133,383	69,622	1,203,005
Chemical and other industrial:						
Quicklime	4,558,612	1,205,465	5,764,077	4,425,146	1,267,057	5,692,203
Hydrated lime	769,237	202,463	971,700	791,738	214,406	1,006,144
Total	5,327,849	1,407,928	6,735,777	5,216,884	1,481,463	6,698,347
Refractory (dead-burned dolomite)	2,065,036	63,924	2,128,960	2,401,966	21,943	2,423,909

[1] Includes Hawaii and Puerto Rico.

GENERAL REFRACTORIES

A COMPLETE REFRACTORIES SERVICE... *for Rock Products*

Whether it's a portland cement plant, a lime plant, a gypsum plant, or a kiln for burning dolomite and magnesite—we can supply all of your refractory requirements.

Here are some Grefco refractories which should prove of particular interest to you:

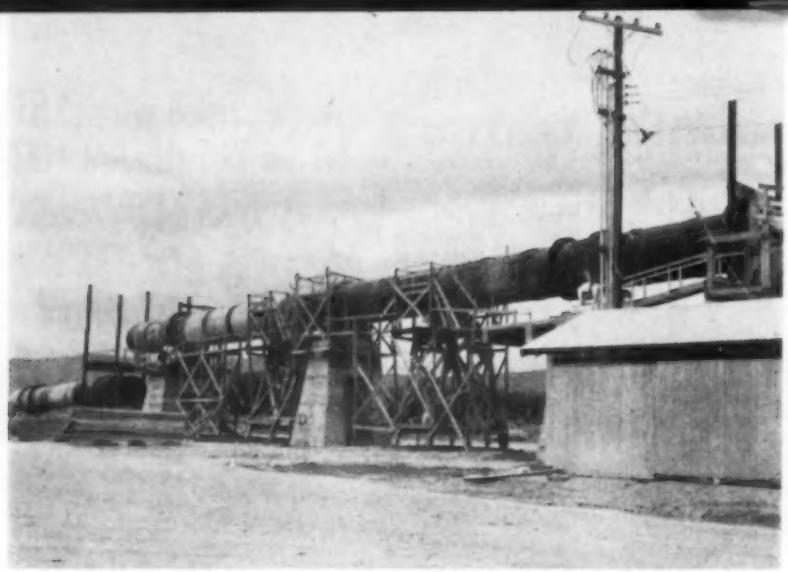
RITEX MAGNESITE BRICK — a patented, chemically bonded basic brick for lining the burning zone of rotary cement, dolomite and magnesite burning kilns subjected to service too severe for high alumina brick linings. RITEX also has applications in many vertical (shaft) limeburning kilns.

STEELKLAD BRICK—a RITEX basic brick with steel plates already attached. It may provide major savings in your operation.

HIGH ALUMINA BRICK—These come in a full line of shapes and sizes. ARCO-70 (70% Alumina) is most generally recommended, though brick ranging from 50% to 85% Alumina can also be furnished.

As part of our complete refractories service, we have developed cements, mortars, plastics and castables for the service conditions which have proved long-lasting and economical. They meet all the varying requirements of dry or wet application and cold or hot sets. Delivered in cans or bags of various weights.

GENERAL REFRACTORIES CO.
Philadelphia 2, Pa.



First of the two 7½- by 150-ft. rotary kilns being installed at the new plant of the Chemical Lime Co. Rotary cooler is seen at extreme left.

Chemical Lime Company—

First Large Scale Commercial Lime Producer in Oregon

By HARRY F. UTLEY

ANOTHER ON THE SPOT REPORT

PRODUCTION got under way in September, 1957, in the modern, new rotary-kiln lime plant of Chemical Lime Company, Baker, Oreg. This 75,000-ton-capacity facility, located on Wing Siding of the Union Pacific Railroad a few miles north of Baker, obtains its stone by truck from a quarry opened up at 5,400-ft. elevation on Marble Creek in the Blue Mountains, 10 miles west of the plant.

As soon as the first 7½- by 150-ft. kiln and cooler became operative, installation began on a second Vulcan calciner of similar size alongside the first. Kiln No. 2 was slated for operation some time in November.

Output includes chemical-grade lime, pulverized quicklime, regular and superfine hydrate, and various limestone products. The new operation is owned by Anthony Bradenthaler and Thomas W. Dant, prominent lumbermen in the Northwest. Robert G. Vervaeke, general manager, responsible for the basic design, developed the flow-sheet at the quarry and in the plant. Engineering details were handled by the firm of Stoyanov & Johnson, of Portland.

Natural outcroppings and extensive exploratory drilling indicate a proven reserve of about 3,000,000 tons of excellent high-calcium stone in the deposit. The quarry is being developed on 20-ft. benches, using Worthington wagon-drills and millisecond-delay blasting procedures. Great care is exercised in detonating the blasts in order not to disturb adjoining underground springs which supply water to the city of Baker. Little stripping is required.

After it has been blasted, the stone is loaded by a 1½ cu. yd. Bucyrus-Erie shovel into Koehring Dumptors, which deliver over a haul averaging 350 ft. to a mountainside hopper. A 42-in. by 15-ft. Lippmann apron-feeder beneath the hopper passes the stone over a grizzly to a Pioneer 3042 jaw-crusher powered by a 150-hp. Westinghouse V-belt-drive motor. The primary crusher is set to break everything down to minus 5 in. and a 30-in. by 70-ft. belt conveyor builds up a 2,000-ton surge pile. Recovery from the pile is by way of a Pioneer apron-feeder and tunnel belt carrying to the screen house and secondary crusher.

The first pass is over a 5- by 10-ft. Tyrock double-deck screen. The top deck scalps off plus 3-in. oversize which goes to a 3-ft. Traylor TY reduction crusher. This crusher is closed-circuited with the sizing screen, a 4- by 10-ft. El Jay triple-deck unit. Finished product is conveyor-stored in three 360-ton steel truck loading bins, the kiln-feed stone being produced in two blends —minus 1½ plus ¾ in., and minus ¾ plus ⅜ in. The minus ⅜-in. limestone is to be sold commercially,

either as produced or subject to further processing to meet the demands of the market.

Delivery to the lime plant at Wing Siding is by contracted International truck-trailers carrying 26 tons per trip. The quarry plant operates on an 8-hr. single shift, and the trucks run on two shifts. Winters are relatively severe, so that the quarry will shut down for about three months in mid-winter; but sufficient stone will be in storage at the lime plant at all times to permit year-round capacity operations. This is amply provided for by the establishment of a 30,000-ton capacity stockpile at the plant.

The stockpile is built up by a 24-in. by 250-ft. conveyor inclining upward from the 40-ton live-bottom receiving hopper to a 42-ft. high timber trestle. At the top of the trestle, transfer is made to an 18-in. by 700-ft. horizontal conveyor, a Rex tripper discharging the stone as desired at any point along the 700-ft. span.

The two kiln stone sizes are kept separate for uniformity in burning. One of the kilns utilizes the 1½-in. feed and the other the ¾-in. in accordance with accepted calcining practice. The stone is layered in the pile as received to effect a rough blend. There are 16 draw points in the 700-ft. reclaiming tunnel for loading out onto the 18-in. by 800-ft. belt in the tunnel, which carries the material to a 50-ft. bucket elevator. This elevator, in turn, supplies the 50-ton kiln-feed bins.

Feed to the kilns is held within close limits by Syntron vibratory feeders, and the kilns are fired with Coen combination gas-oil burners. Natural gas became available only within the last year in the Baker area, and oil-firing is expected to be resorted to for only a part of the time in the winter months.

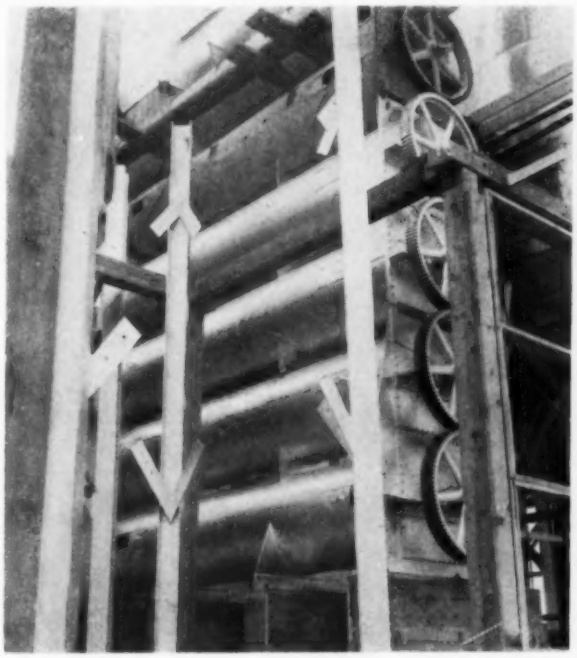
Each kiln is turned by a 30-hp. motor, one of the drives being a Louis Allis motor transmitting power through a Western Gear reducer; the other is a U. S. Motors Vari-drive unit, believed to be the first adaptation of this variable-speed combination to kiln-drive service. In the event of public-utility power failure, a 75-kv.-a. gasoline-engine generator set can supply standby power to the kilns directly through the drive motors.

Both kilns are lined with Gladding-McBean, Columbia and Diablo refractories except for 30 ft. in the hot zones, where J-M 70 percent alumina brick is employed. Exhaust is through 75-ft. stacks, aided by American Blower induced-draft fans. Dust chambers are equipped with cyclone collectors.

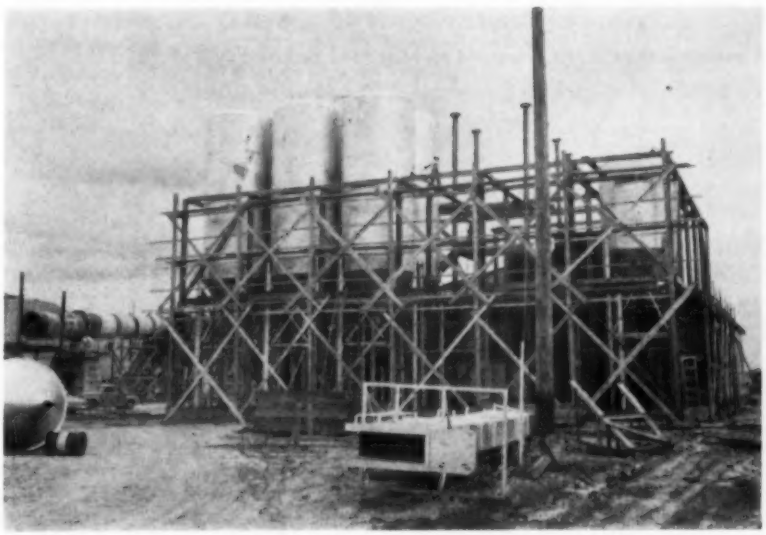
The kiln-control panel is located inside a pressurized cubicle, and instrumentation, largely provided by Honeywell, is adequate, to say the least. The panel mounts ammeters which indicate current draw on the kiln and fan motors; gauges measuring and regulating draft within the dust chamber and at the fans themselves, automatic oxygen analyzers, optical pyrometers, and recording and control devices which measure exit- and discharge-end gas temperatures.

After being cooled to 300 deg. F. or less in 7- by 60-ft. rotary coolers, the lime is elevated to an El Jay screen for sizing over ¾- and ⅜-in. mesh decks. The pebble lime is stored in six 70-ton steel bins, the transfer being made by Link-Belt Coil-Mount natural-frequency conveyors. Lime may be withdrawn from any of these bins for loading into railroad cars or trucks, or it may be elevated to a 50-ton surge bin ahead of a Williams suspended-roller mill equipped with air separation for pulverizing. The pulverized

(*Continued on page* 150)



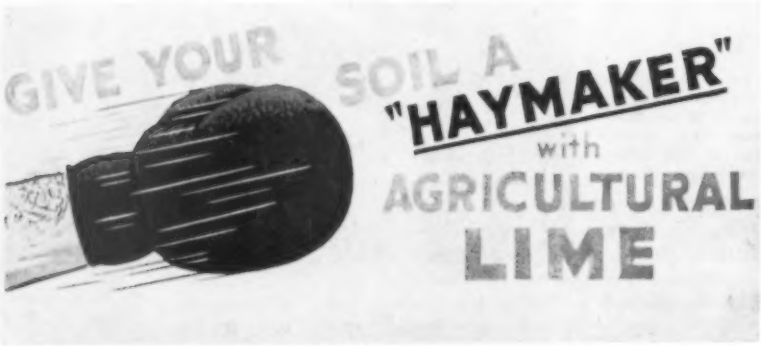
Six-tube continuous hydrator is fed from a 15-ton surge bin by a constant-weight feeder through seal valve above.



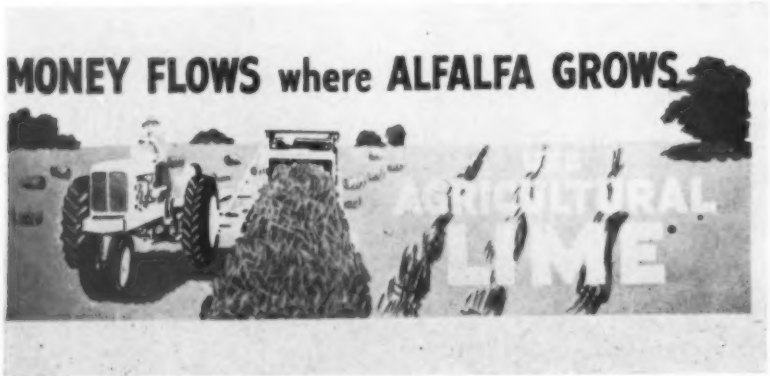
View taken during construction shows the six 70-ton quicklime steel storage bins at left behind scaffolding.

Iowa Aglime Group Poised With 1958 Billboard Program

The January-February poster sets the LIME tone for the year.



A message with an impact is featured for March and April.



The May-June display plays up the benefits of lime to crops.

THE ninth successive year of a billboard advertising program publicizing the need for agricultural lime in the country's soils will soon be under way. In 1949 the Iowa Agricultural Limestone Association, with impetus provided by Clint A. Allen, executive secretary, pioneered the use of this type of advertising, dedicated toward acquainting both the farmer and the general public of the beneficial results accruing from the use of this material.

Impressive billboard posters to be used during the coming year are shown here. On January 1, the first of this series of six will be put on billboards along Iowa highways, as well as in areas of neighboring states.

The new series prepared each year is made available to agricultural limestone producers in Iowa, and to interested operators in other states. Each poster is displayed for a 60-day period, and has the name of the participating producer imprinted across the bottom in lettering 21 in. high. When mounted on an outdoor billboard, the posters have dimensions of approximately 12- by 25-ft., and are easily read from the highway at a distance of 100 yd.

As noted by Mr. Allen and others acquainted with the importance of agricultural liming to the nation's agriculture, a new and possibly more critical factor has been added to the overall picture. Scientists have stated there is reason to believe that strontium 90 fallout from atomic explosions is a pollutant of both the atmosphere and the ground surface on which it falls. Animals grazing on growth from these soils, and man himself, as an ultimate consumer, could experience deadly results.

However, it is known that a proper proportion of calcium in the soils will offset the presence of the radioactive materials since plant growth will absorb the former—if available in sufficient quantity—in preference to the latter. Thus aglime takes on the role

(*Continued on page* 150)

Helping Lehigh Portland Cement Co. keep production *HIGH*

Moving overburden to reach coquina shell at Flagler Beach, Fla.

Three loading stations fill rail cars with finished cement at the Bunnell, Fla., plant of Lehigh Portland Cement Co. It takes a busy, complex operation to keep these loading stations on the go. The operation begins beneath the Florida sand, where coquina shell is found. It is the principal raw material—used here for the first time in the U. S.—in the making of Portland cement.

Two giant Caterpillar DW21s, with No. 470 Scrapers push-loaded by a D8, move the sand overburden so a bucket can get at the shell. This is a job that calls for fast cycle time and plenty of stamina. The CAT* DW21 (Series C) supplies both. Powered by a Cat Turbocharged Diesel Engine with a maximum output of 300 HP, the DW21 can range in speed all the way from 2.3 to 25.1 MPH. It develops rimpulls up to 38,420 lb. It shifts easily, up or down, and steering is smooth. Its steering wheel really controls the unit, responding the way an automobile does. Its big wide-sectioned 29.5 x 29 tubeless tires give maximum flotation and traction and bring real cost savings over old-fashioned tubes and flaps.

Its partner, the No. 470 Scraper, incorporates a new, advanced engineering concept—LOWBOWL design. Here's a scraper that gets capacity loads in a hurry—18 yards struck, 25 heaped. It features a wider, longer bowl that holds more *heaped* yardage, with lower sides that cut overhead weight and internal friction.

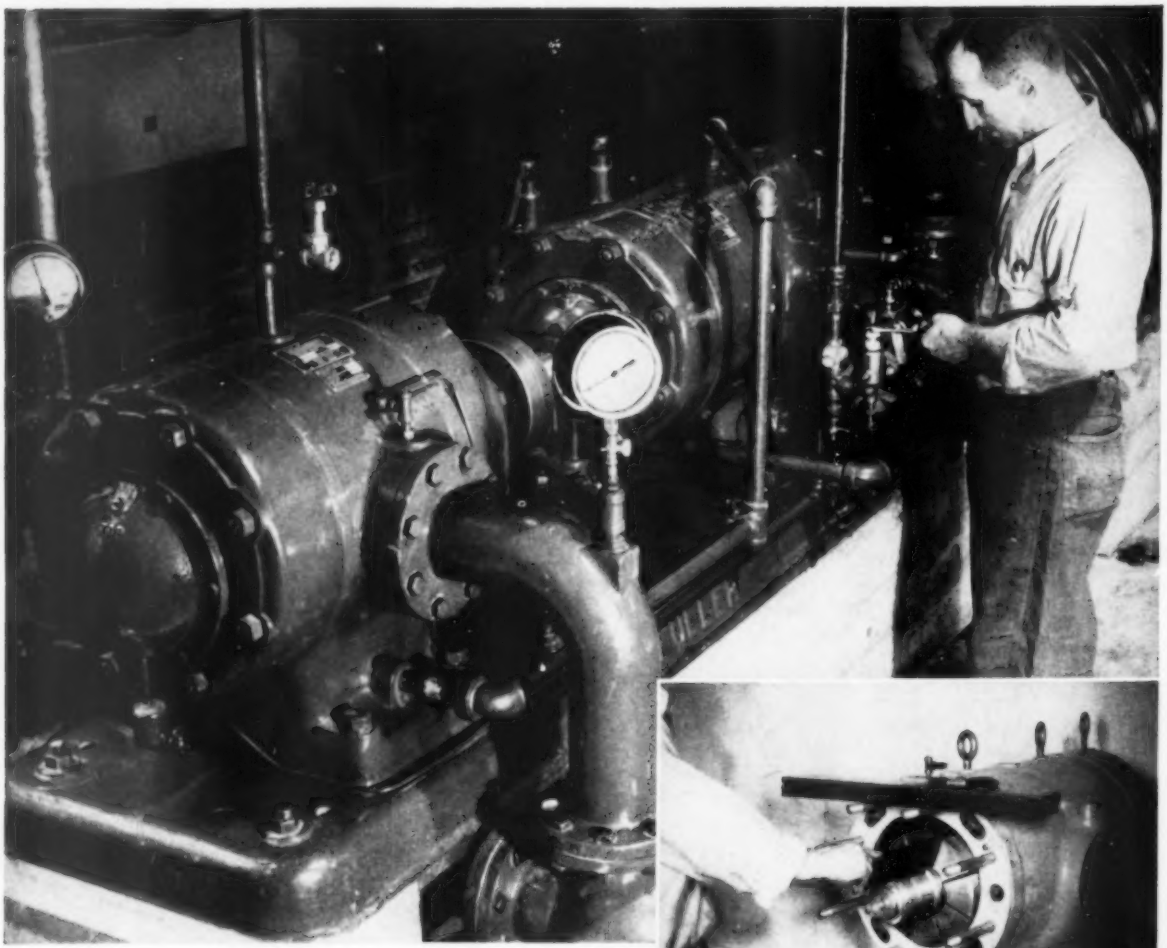
Features like these help keep Lehigh Portland's production high. They can help on your operation, too. For complete details on any Cat wheel rig for pit or quarry, call your Caterpillar Dealer. Remember him, too, for expert service—and for parts you can trust.

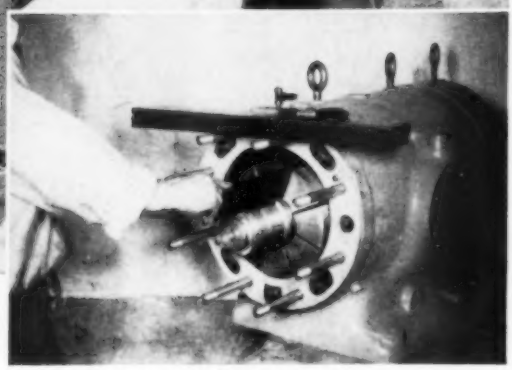
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE





Blade inspection

PERFECT COMBINATION OF MEN AND MACHINES

Providing plant air for varied uses imposes heavy responsibility on both the compressor and its operator to keep production moving.

The simplicity of the Fuller Rotary Compressor principle reduces maintenance to an absolute minimum; by the same token, operator's universal pride in Fuller Rotary performance contributes to longer life of the compressor. Few moving parts and smooth operation limit the operator's work to periodic inspection.

This perfect combination of men and machines is worth investigating, with an eye to economies you, too, can enjoy. Write to Fuller Company, compressor sales department for detailed information.

FULLER COMPANY
100 Bridge St., Catasauqua, Pa.
SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION
Birmingham · Chicago · Kansas City · Los Angeles · San Francisco · Seattle

C-316
4686

PIONEERS OF HIGH-EFFICIENCY VANE TYPE ROTARY COMPRESSORS SINCE 1930

The Equipment Superintendent of the Ohio Turnpike shows how easily the test is made.

A toll gate on Ohio Turnpike . . . one of America's newest highways.

The simple test reveals many things about a vehicle's engine, and individual cards give a permanent record. The Indicator Fluid is covered by Patent No. 2,770,530.

OHIO TURNPIKE REPORTS:

"Greater oil economy . . . reduced maintenance costs . . . thanks to the SHELL ADC Oilprint Analysis."

THE OHIO TURNPIKE operates 225 maintenance and patrol vehicles over its new highway to assure *maximum road safety*. The Shell ADC* Oilprint Analysis was recently adopted so that the oil in every vehicle in the fleet can be constantly checked.

With just two drops of oil, the ADC Oilprint Analysis gives a fast, periodic, on-the-spot check of existing oil conditions. Unnecessary oil changes are eliminated, and in addition, costly engine repairs can be avoided when potential engine trouble is revealed. All this is accomplished *in just a few minutes.*

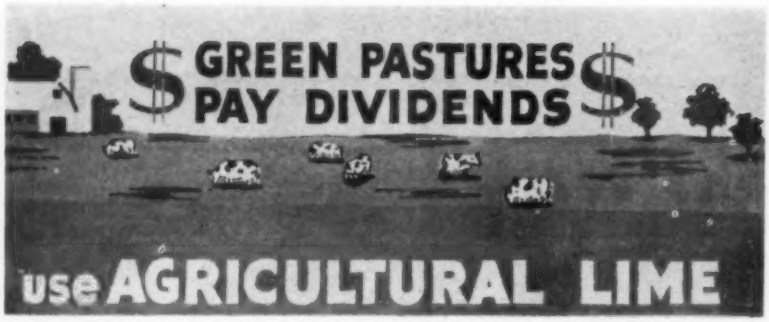
Let a Shell Representative demonstrate the simple application of this program. You'll see for yourself why cost-conscious fleet operators are proving the Shell ADC Oilprint Analysis a valuable preventive maintenance tool. *Trademark

SHELL OIL COMPANY

50 WEST 50th STREET, NEW YORK 20, N. Y.
100 BUSH STREET, SAN FRANCISCO 6, CALIF.

SHELL

A reference to dollar dividends sparks the July-August poster.

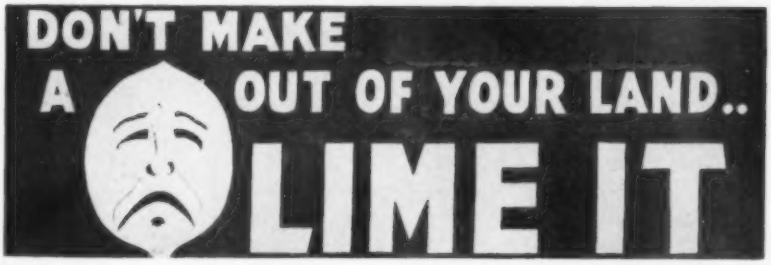


of a safety factor in the atomic age.

Individual producers interested in advancing aglime sales through this medium may obtain full information and contract forms from the Iowa association by contacting Clint A. Allen, executive secretary, Iowa Agricultural Limestone Association, Inc., 400-401 Teachout Bldg., Des Moines, Ia. In order to employ the entire series, orders must be placed at once.

Posters in lots of 25 or more are also available to associations in other states.

Prior to arranging an order for the posters, Mr. Allen suggests that yearly contracts be made with local billboard companies for billboard space. The posters will then be shipped directly to the latter companies, who will service the displays every 60 days without further concern to the producer.



Soil acidity and its cure form the double basis of the September-October slogan.

Reynolds Metals Prospecting For Australian Bauxite

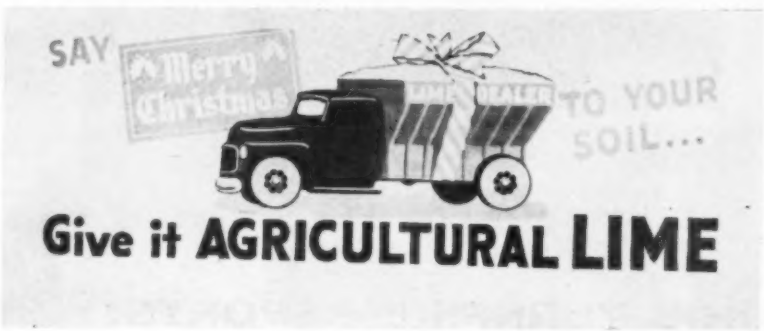
Reynolds Metals Company has formed the Reynolds Pacific Mines, Ltd., as a wholly-owned Australian subsidiary with headquarters in Melbourne. The subsidiary company was formed with an authorized capital of five million pounds (Australian), or about $11,250,000.

Richard S. Reynolds Jr., president of Reynolds Metals and board chairman of the new subsidiary, stated that it is hoped the Australian company will find and acquire substantial bauxite deposits and other raw materials which will ultimately justify the establishment of an integrated aluminum industry in Australia.

According to Walter L. Rice, president of the Australian company, preparations are under way to send geological teams into various parts of northern Australia. Equipment is being shipped from the United States for the exploration work.

G. D. Wotherspoon was elected president and John M. McConnell vice-president and a director of the Lake Ontario Portland Cement Company, Montreal, Que., to succeed Senator W. A. Fraser and John C. Udd, respectively.

Hixson Rock Company has begun limestone quarry operations at Hixson, Tenn. The new firm is owned by Boyd Hutton.



A holiday mood points up the sixth poster, to be displayed during November and December.

Chemical Lime Co.

(*From page* 145)

quicklime goes to a 20-ton bin which feeds to a St. Regis 2-spout bag packer.

Hydrate is prepared continuously in a 6-tube Kritzer hydrator fed from a 15-ton surge bin by a Hardinge constant-weight feeder through a Sturtevant seal valve. The feed bin is equipped with high- and low-level Bindicators for automatic control of the operation of the elevator and screw-conveyors which draw the lime from the storage silos. Lime to be hydrated may be transferred directly, or it may first be ground in a Sturtevant swing hammermill, depending upon size.

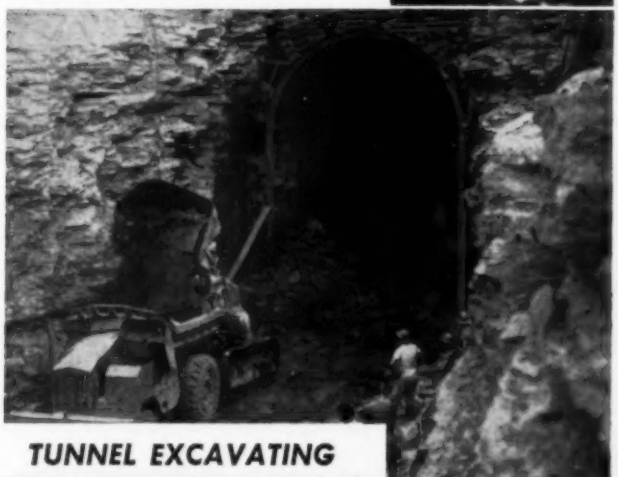
The finished hydrate is elevated to the top of the building and can go either directly to a surge bin ahead of a No. 3 Raymond mill, or to a pair of 60-ton seasoning tanks prior to grinding. The mill is equipped with double whizzers and has integral air separation. Prior to bagging or bulk loading, the hydrate is stored in a 20-ton bin.

Since the water table at the plant site is only 4 ft. below the surface, all structures are on floating foundations except for the kiln supports. The 700-ft. reclaiming tunnel beneath the stone-storage pile is likewise above ground for the same reason. A double spur track was laid to provide ample car capacity and loading facilities. Conveyors are made up of Rex rolls and idlers and Goodyear belting. Future plans tentatively call for the installation of CO_2 recovery equipment.

MR. CONTRACTOR

IN SPOTS LIKE THESE YOU NEED AN EIMCO EXCAVATOR

TIGHT QUARTERS



TUNNEL EXCAVATING

LOADING HEAVY ROCK

Illustrated are just three job conditions where 105 Eimco Excavators outperform other earthmovers. It takes care of the tough jobs just as efficiently as it does the easy ones.

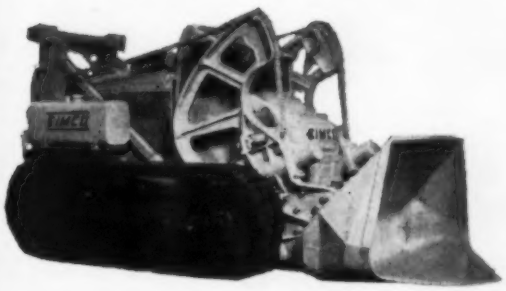
The knowledge and experience gained from building thousands of underground loaders was used to full advantage when we designed and engineered the Eimco Excavator. We gave it the same extra strength for severe service; increased the life and efficiency of working parts thru simplification; gave it I.T.R. (independent track reversal) mobility and "passenger car" power-shift operating ease. Then we put the operator up front where he can see what's going on.

Overhead discharge speeds cycle time; makes it possible to dig, load and dump from one position and do road-work without stopping highway traffic.

With powerful crowding action (39,000 lbs.) the Eimco 105 loads large rocks without secondary blasting usually required when boom shovels or other loaders are on the job.

The Eimco 105 Front-End Loader combines this same high tractor mobility with front end loading versatility for handling scores of different jobs economically.

Write for information on the Eimco 105 Tractor Excavator or Front-End Loader . . ideal highway building tools.



EIMCO 105 EXCAVATOR

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Pittsburgh, Pa. Seattle, Wash.
Cleveland, Ohio Houston, Tex. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-293

Legal Decisions

By LEO T. PARKER

Attorney at Law
Cincinnati, Ohio

Recently, I received several interesting letters from readers asking legal questions on the subject of insurance. In a recent article I pointed out that a great many holders of insurance policies pay for insurance for many years not knowing that the policy is void for various reasons. If no loss occurs, the holder of the insurance policy feels secure, without the knowledge that his policy is invalid and he has no protection against ultimate losses, believing he is covered.

First, I shall consider the relatively simple case of *C. M. Company v. Employers Mut. Liability*, 19 N. W. (2d) 523. In this case it was shown that an employee sued the C. M. Company to recover damages for injuries which he alleged were sustained by reason of negligence of the employer in failing to provide a safe place in which to work. The employee alleged that as a result of such negligence he contracted a disease known as pneumoconiosis, or silicosis.

The C. M. Company carried insurance to protect it against such suits, but the insurance company denied that the damage claimed in the suit instituted by the employee were covered by its policies. The insurance company defended the suit on the grounds that its policy failed to specify that insurance was provided with respect to occupational diseases.

Although officials of the company believed that its insurance policy covered occupational diseases, the higher court held the C. M. Company not protected by the policy. The higher court said restrictions in a policy are valid and the holder of the policy is fully obligated by such restrictions. The court further stated that the disease "silicosis" is not covered by an "accidental" insurance policy, and failure of the holder of an insurance policy to read it and know the limitations does not in any respect obligate the insurance company.

Therefore, this late and leading higher court decision clearly establishes the law that an insurance company is liable under its policy solely by its contents. This is so irrespective of the fact that the holder failed to read the policy and know its legal effect. This is further so although the agent representing the insurance company assured the holder of the policy that such policy afforded full and complete protection.

For illustration, in *State Corporation v. Travelers*, 30 S. E. (2d) 377, it was shown that an insurance company issued an insurance policy. Later the holder of the policy requested the insurance agent to include in the policy "robbery" insurance for $1,000 on the outside, and $1,300 on the inside, and burglary insurance. The insurance agent notified the insured by letter that the policy had been changed to include this desired coverage. However, the policy was not changed by the insurance company to include the desired coverage, but the insured kept the policy, believing that it included the agent's representations. When a loss resulted from burglary, the insurance company refused payment, and the policy holder filed suit.

The higher court refused to hold the insurance company liable and said that when an applicant for insurance receives a policy which does not conform to the agent's representations, *he must notify the insurance company of the variance.*

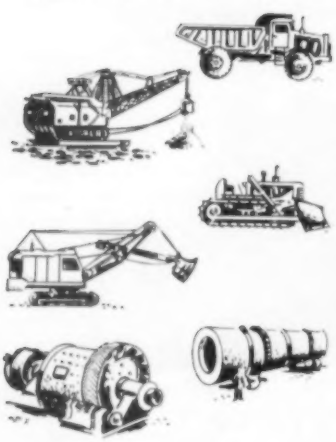
In other words, the holder of an insurance policy is lawfully obligated to read it carefully and immediately notify the insurance company if the policy fails to contain protective clauses which he believes the policy should contain.

Beware of Errors

A common source of legal controversies over insurance policies involves insurance applications filled out by the insurance company's agent and signed by the applicant. The higher courts hold that the applicant is fully responsible for the truth of the answers to questions in his application, although the insurance agent incorrectly filled in the answers and did so without knowledge of the applicant.

In a recent higher court case, for instance, an insurance company's agent filled in an answer to a question, saying that the applicant had

WANTED
YOUR TOUGH LUBRICATION JOBS



World-famous Whitmore Lubricants succeed where others fail. They are lubricants, not greases. Whitmore's exclusive never-duplicated formulas stop metal-to-metal contact—put wear on the lubricants instead of on costly gears, bearings, and cables. That's why manufacturers of earth, rock, coal, and ore moving and processing equipment recommend Whitmore Lubricants to give you the service they built into your equipment.

65 YEARS OF LEADERSHIP
LUBRICATING THE FOLLOWING:

OPEN GEARS, DIPPER STICKS, AND CAMS
Never-duplicated formulas that provide a hard finish impervious to moisture. Absolutely impossible for dust to cling to lubricated surfaces.

ENCLOSED GEAR CASES
Extremely high load carrying capacities for climatic conditions from the Tropics to the Arctic.

WIRE ROPE AND CABLES
Increases yardage life up to three times. Absolutely stops corrosion by penetrating to the cable core and eliminating internal friction.

Complete Line of Lubricants for Hydraulic Units; Torque Converters; Roller, Ball, and Sleeve Bearings; Speed Reducers.

Write for FREE samples, FREE data, FREE "on your job" engineering assistance.

THE WHITMORE MFG. CO.
LUBRICATING ENGINEERS
CLEVELAND 4, OHIO, U.S.A. PHONE: VULCAN 3-7272

no medical attention during the last six months. Later the higher court held the policy void because the testimony showed that the applicant had received medical attention just two months before he signed the application. This court held the insurance company not responsible for its agent, who knowingly and incorrectly filled in answers to questions later signed by the applicant for insurance.

Inform Insurance Company

As previously stated, many persons faithfully pay premiums to insurance companies when in fact the policies are void. A good motto is: "Read your insurance policies, and carefully abide by all clauses." If you fail to do so, you may be surprised to learn, when you have a loss, that your policy is void.

For instance, in *Hartford Accident & Indemnity Company,* 268 S. W. (2d) 419, the testimony showed that a motor truck owner named Blake held an automobile liability insurance policy which stated that his truck was to be used in hauling exclusively for a man named Low, and occasionally used for "other business purposes."

Without notifying the insurance company that he had stopped hauling for Low, Blake continued to transport the same kind of merchandise for another company to the same consignee he had served for Low. Blake had a bad accident. In subsequent litigation, the lower court held that the insurance company was liable on its policy. However, the higher court reversed the verdict, saying:

"It is evident that prior to the accident the insured (Blake) was not hauling for Low at all, much less exclusively. Since the restrictive coverage was reasonable, and since the use of this truck at the time of the accident did not come within the terms of the policy even if extended to 'occasional use,' appellant (insurance company) should not have been held liable."

The strange part of the above case is that simply because Blake failed to notify the insurance company that he was hauling stone and sand and gravel to the Gorman Construction Company, and not for Low, the higher court held that he had violated the terms of the insurance policy. The insurance company thereby rendered the policy void, relieving itself of its normal obligations.

Must Notify Insurance Company

Modern higher courts consistently hold that if a motor vehicle is insured by its owner, and later ownership is transferred to another person without giving the insurance company due notification, the insurance policy is void.

For example, in *Bettinger v. Northwestern Company,* 213 Fed. Rep. (2d) 200, the testimony proved that a motor truck liability insurance policy was issued to one Bettinger. Without notifying the insurance company, Bettinger transferred ownership of the truck to his son, who later had a bad accident while driving the vehicle.

The higher court held Bettinger personally liable in heavy damages to a person injured in the accident but, at the same time, refused to hold the insurance company liable on the policy.

This higher court explained that an insurance policy which insures a named person is automatically rendered void if the insured person is substituted by another person not approved by the insurance company.

Must Keep Insurance Live

Recently, a higher court held that if an insurance policy fails to remain "live," it is void. In this respect it is common practice for operators of nonmetallic plants, which operate motor vehicles, to pay for insurance policies after the same are renewed and the bill for the insurance is received from the insurance company's agent. This is bad practice and may result in heavy financial losses.

For example, in *Mallard v. Indemnity Insurance Company,* 216 S. W. (2d) 263, the testimony showed that a corporation held a collision insurance policy on a motor truck. The policy expired on July 31 and the truck was wrecked August 30. The insurance company had sent a bill for a renewed insurance policy stating that the policy gave protection from expiration of the old policy on July 31.

Immediately on receiving this letter from the insurance company, the corporation sent its check for the amount of the bill for the new policy, and notified the company of its claim for a wreck on August 30.

In subsequent suit the higher court held that the insurance company need not pay the claim and said:

"Appellant's (corporation's) claim for recovery is based upon the theory of an acceptance of appellee's (company's) offer after the automobile had been damaged . . . It seems clear that on August 30 (the date the automobile was damaged), there was no valid binding contract of insurance between the parties."

QUICK way to cut downtime!
ECONOMICAL, too!
REBUILD
Worn Tractor Grousers
with
SS HI-C
TRACTOR GROUSER BARS
SPECIAL ANALYSIS HIGH CARBON STEEL
Attaches quickly with any good grade of low hydrogen electrode.
Easy to attach with any manual or automatic electric welding method.
Write for complete details and nearest distributor.
MEMBER
NATIONAL WELDING SUPPLY ASSOCIATION
SOLE PRODUCERS
STULZ-SICKLES CO.
PORT AVENUE at JULIA ST. ELIZABETH, NEW JERSEY

Quite obviously this litigation involved unusual legal procedure. Nevertheless, the outcome of this law suit clearly illustrates that the holder of an insurance policy should, without fail, pay insurance premiums before the same are due and thereby keep the policy "live."

These facts must be realized:

An insurance policy is a contract between the insurance company and the applicant for insurance. Hence, the insurance company is not liable on its insurance policy unless the testimony clearly shows that both the applicant and the company agreed to the exact provisions and clauses in the policy. Therefore, the fact that an insurance policy contains clauses not read by the holder of the policy has no legal effect relative to the extent and validity of the policy. If the holder of an insurance policy fails to read it, he is not excused by the law notwithstanding the fact that the testimony shows that the insurance company's agent orally promised protection not contained in the policy. Later in these pages I shall review late and leading higher court decisions involving this law.

No Compensation for Horse-Play

Recently, I located a higher court decision which answers this legal question: "If an employee is injured while 'playing' with another employee during regular working hours, is the employer liable for payment of compensation or damages to the injured employee?"

Modern higher courts consistently hold that before compensation is payable to an employee under the Workmen's Compensation Act, the employee must prove (1) that the injury arose out of his employment; (2) in the course of the employment; and (3) that the accident was within the purview of the State Workmen's Compensation Act. All three of these elements must concur, and all must be proved, before an injured employee may recover compensation under the State Workmen's Compensation Act.

For example, in *Givens v. Travelers Insurance Company,* 30 S. E. (2d) 115, it was shown that an employee named Givens made a loud noise by slamming a machine down on a table immediately back of another employee, named Carruth. The noise resembled the shooting of a gun, and it scared and excited Carruth so that he instantly threw a "separator" which he had in his hand. The "separator" hit Givens in the eye, causing a serious injury.

Givens sued to recover compensation under the State Workmen's Compensation Act. The higher court refused to allow compensation, and said:

"The rule is well enough settled that where workmen step aside from their employment and engage in horse-play or practical joking, or so engage while continuing their work, and accidental injury results, the injury is not one arising out of the employment within the meaning of compensation acts."

What Is Total Disability?

Considerable discussion has arisen from time to time over the legal question: Can an employee be "totally disabled" and continue to perform his regular work?

According to a recent higher court the answer is yes.

For example, in *Pea Company v. Taulbee,* 294 S. W. (2d) 925, the testimony showed facts, as follows: A man named Taulbee has been a miner for more than 30 years, and for most of this time was employed by the Pea Company. He worked chiefly as a helper on a cutting machine. There was evidence that part of the time the cutting was through sand rock of varying degrees of silica content, and that rock dust in the air was occasionally very thick. Taulbee testified that he first learned that he had silicosis in 1953, when he lost consciousness in the mine. He was hospitalized during the next seven weeks and treated by the Company physician, Dr. Solomon. Dr. Solomon testified that Taulbee had silicosis and was totally disabled.

The State Workmen's Compensation Board had made an award of compensation for full disability while Taulbee was still doing work similar to that performed by him before the award was granted. The higher court approved the verdict although the employer contended that Taulbee's remaining at his job after he was found by the Board to be completely disabled is conclusive proof that his disability is not complete and total. The higher court said:

"Total disability does not mean absolute prostration or complete physical helplessness . . . If the medical evidence of disability is sufficiently convincing, it is even possible to find total disability during a period when claimant (Taulbee) is working at his regular job with no reduction in pay."

Silicosis Not Regular Disease

Recently a higher court held that an ordinary employee in usual employment cannot recover compensation under the State Compensation Act for a disease known as "silicosis"

It pays to Specify
AJAX
The World's Most Complete Line of
FLEXIBLE COUPLINGS
AJAX DIHEDRAL COUPLINGS
AJAX Patented Dihedral tooth shape handles angular and offset misalignment up to 12 degrees.
AJAX RUBBER-BRONZE CUSHIONED COUPLINGS
Safeguard your machines against costly shutdowns. Standard of industry for 37 years. All types and sizes.
Write for Ajax Technical Catalogs. Representatives from coast to coast.
AJAX FLEXIBLE COUPLING CO. INC.
WESTFIELD, NEW YORK
Also manufacturers of Ajax vibrating conveyors, screens and packers.
Ajax Type A Semi-Steel and Type S Forged Steel Couplings
Ajax Type SP Shear Pin Coupling
Ajax Type BO Bolt-On Coupling
Ajax Type M Mill Motor Coupling
Ajax Type BD Brake Drum Coupling

San Andreas, California . . .

another example of the cost-cutting features that bring repeat orders for Bucyrus-Erie rotaries

On the strength of the performance records of a Bucyrus-Erie 50-R rotary blast hole drill placed in operation in 1954, the Calaveras Cement Company recently installed a new Bucyrus-Erie 40-R drill at its No. 1 quarry near San Andreas, Calif.

The 40-R is drilling 9-in. holes through limestone to an average depth of 70 feet. Even though this rig has been operating only a short time, the drill operator reports the 40-R is "doing a fine job." Calaveras Cement is believed to be the first cement company in the West to convert completely to rotaries — all Bucyrus-Erie.

Among the many reasons for the outstanding success of these drills are: rotary drive with Ward Leonard electric control of rotating speed; hydraulically powered pulldown force; remote-controlled power-driven tool handling unit; and air blast cleaning of drill holes.

Two models are available — the 40-R for drilling 6¾- to 9-in. holes, and the 50-R for drilling 9⅞- to 12¼-in. holes. Holes can be drilled continuously for 32 ft. 9 in. (50-R) and 27 ft. 9 in. (40-R) before an additional pipe section has to be added.

Bucyrus-Erie rotaries can speed your drilling operations . . . cut your drilling costs. Write direct for detailed, illustrated literature. 57857C

A Familiar Sign . . . BUCYRUS ERIE *. . . at Scenes of Progress*

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

which affects the lungs of employees who regularly breathe dust.

For illustration, in *Marshner v. American Hardware Corporation*, 110 Atl. (2d) 461, it was shown that an employee of the American Hardware Corporation contracted an occupational disease known as silicosis and was totally disabled. The testimony showed that he required medical and hospital attention because of his poor physical condition and that he would live longer had he not contracted the disease.

The testimony showed further that the employee had been employed as a stone mason. His job entailed all of the usual work of a mason.

In view of this limited testimony, the higher court held that the employee was not entitled to recover compensation under the State Workmen's Compensation Act for the disease silicosis, and said:

"Fire brick and most concrete contain silica. Most of his mason work, however, was performed in the open air or in large factory rooms. Certain work undoubtedly raised some dust, but there was no extraordinary exposure to it. Masons rarely contract silicosis beyond minimal or first stage. It is not generally recognized as a disease."

Combination of Old Elements

A few weeks ago a higher court held that in determining whether an invention is patentable, the important question is whether other persons "skilled in art" could, without the exercise of inventive faculty, have made the new combination of elements and invention. In other words, although an inventor actually invents something useful and valuable, he cannot obtain a valid patent if old patents show various parts of his invention, and by reference to these old patents a person skilled in the art could have made the new invention. This is so although the inventor had no knowledge of the old and prior patents.

On the other hand, modern higher courts consistently hold that if an invention produces new and better results than with an old device, the inventor deserves a patent although all of the parts or elements in his device are old and disclosed in older patents.

For example, in *Guiberson Corporation v. Garrett*, 205 Fed. Rep. (2d) 661, the testimony showed facts, as follows: An inventor, named Garrett, received a patent for a pressure responsive valve.

Although Garrett's invention was merely a combination of old and well known elements which produced a new and useful result, the higher court held the patent valid and said:

"Plaintiff (Garrett) admitted that his patent was a combination patent, all of the elements in which were old. A patent for a combination can be valid, and we are of the clear opinion . . . this is one of that kind."

Adequate Patent Coverage

An important point of the established law is that if through the fault of a patent lawyer, or the inventor himself, a patent contains weak claims, the inventor must act promptly to have reissued a patent which gives adequate protection.

For illustration, in *Dufault*, 214 Fed. (2d) 181, the testimony showed facts, as follows: In 1944 an inventor, named Dufault, filed an application for a patent and obtained a patent with "weak" claims. Over four years later the inventor discovered that the claims in his patents were not as basic or broad as he was entitled to receive. Then he filed another application and asked the Patent Office to reissue his patent with the basic and broad claims he deserved. The Patent Office refused to do so, saying:

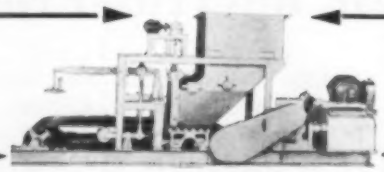
"A patentee has the duty to study his patent promptly and without a specific motive to appraise its breadth. . . . As appellant (Dufault) delayed more than 4½ years in seeking broader claims, it is believed reasonable to assume that any unclaimed material in the original patent has been dedicated to the public."

POINTERS to PROFITABLE SCALING

SCHAFFER
POIDOMETER

PROPORTIONS • RECORDS • WEIGHS
BLENDS • MIXES • FEEDS

HIGH-SPEED ACCURATE



AUTOMATIC DURABLE

Over 1500 now serving Industry

The experience of bulk material handlers everywhere points out the advantages of this all 'round scaling machine.

The Poidometer provides the latest type of equipment for supplying valuable weight-data with speed, precision and economy.

It's easy to install and operate . . . durably built for long, reliable service under all working conditions . . . promotes product uniformity and continuous output.

Poidometers are available with total weight recorders, and remote control devices for showing and changing feed rate.

Write for Catalog No. 5

SCHAFFER POIDOMETER CO., 2828 Smallman St., Pittsburgh 22, Pa.

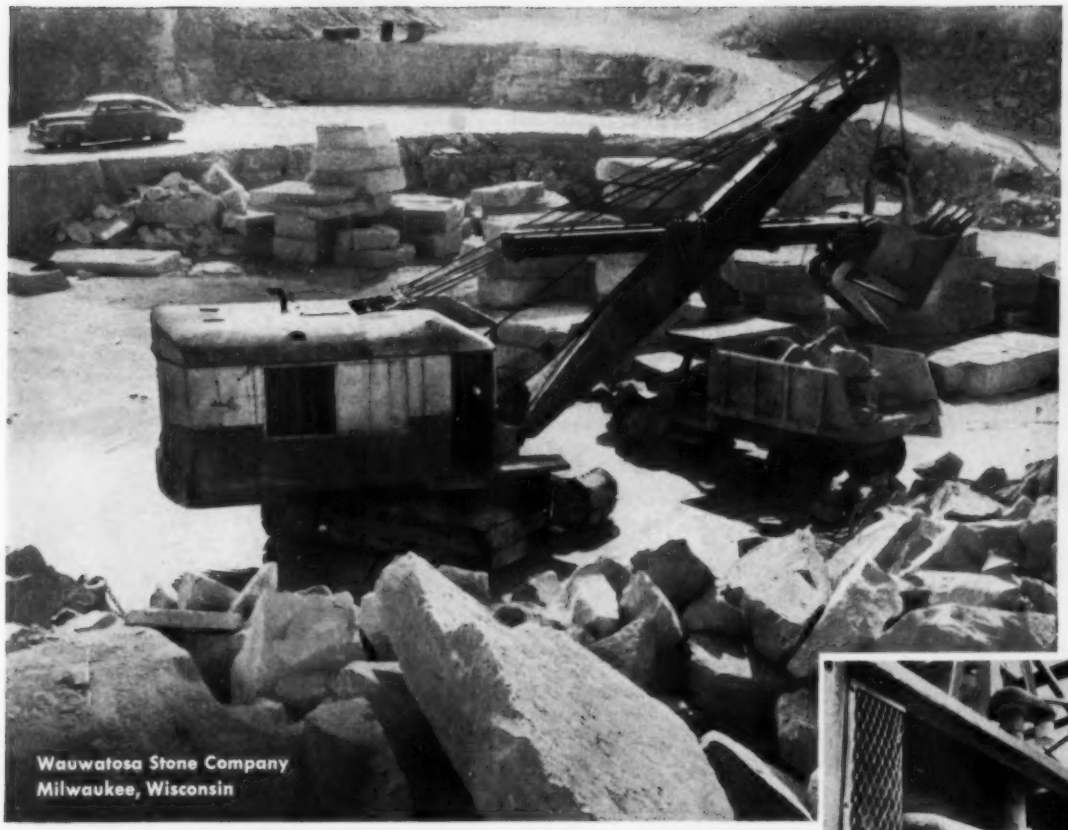
Natl. Slag Assn. Contest

(*From page* 137)

The competition—This safety competition sponsored, by the National Slag Association and conducted by the Bureau of Mines, is open to any slag-processing plant. The plants enrolled are classified in one of two groups: Group A for those that have operated 60,000 or more man-hours from April 1, through March 31; and Group B for plants operated less than 60,000 man-hours.

Eligibility in the competition is maintained by submitting monthly reports on worktime and a report for each disabling or lost-time injury at the plant. Standard injury report forms supplied by the bureau or a copy of the participant's report prepared for compensation commission or insurance carrier may be used.

A plant may be enrolled on applications obtained from the Branch of Accident Analysis, Div. of Safety, Bureau of Mines, Washington, D. C.



OVER 3 YEARS AT THE ROCK PILE— ENGINE ABSOLUTELY UNTOUCHED!

Another record for Cities Service C-300 Motor Oil

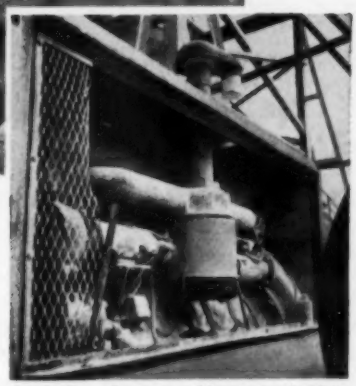
Eight hours a day, six days a week for over three years, this shovel of Wauwatosa Stone Company has been hard at work.

Yet, lubricated by Cities Service C-300 Motor Oil, it has required absolutely no engine work during this entire period!

And it's not the only piece of Wauwatosa equipment with such an outstanding performance record. For, using Cities Service C-300 Motor Oil, **another shovel has gone over seven years without major overhaul!** And the diesel which operates the gyro crusher has already put in two years itself! All this under typically dusty quarry conditions.

"It's not only the motor oil that gives us terrific performance in this work," says Supt. Frank Brezonick. "We're also getting excellent service from Trojan H-2 Grease, Cities Service Diesel Fuel, and our other Cities Service products. All are doing a great job."

In quarry after quarry, you'll hear similar reports about Cities Service fuels and lubricants . . . but more important is what they can do for you. Get the facts from a Cities Service Lubrication Engineer. Or write: Cities Service Oil Co., Sixty Wall Tower, New York 5, N. Y.



More than 2 years without overhaul is the record logged by this diesel using Cities Service C-300 Motor Oil. None is anticipated for many months to come.

Caught in the crush of work . . . stone is dumped into primary crusher. In addition to crushed stone and gravel, Wauwatosa produces riprap for breakwaters and buildings.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS

IT'S **BRAND NEW**

Cleveland's RC-5 — a new quiet, light-duty electric vibrator

- IT'S QUIET
- DEVELOPS 275 LBS. OF CENTRIFUGAL FORCE
- ALL ELECTRIC
- OPERATES ON LESS THAN .5 AMP. ON 220 V.

Compact design for light duty on bins and hoppers, chutes, tubes, and other storage facilities for bulk materials. Prevents bridging, plugging and arching — eliminates processing delays.

Write for detailed information and prices.

Air or Electric
Portable or Permanent
Silent or Standard

2710 CLINTON AVENUE • CLEVELAND 13, OHIO

Manufacturers' News

Acquisition of the Gardner-Denver Company, Quincy, Ill., by Dresser Industries, Inc., Dallas, Tex., subject to approval by shareholders of both companies, has been announced.

Gardner-Denver, producer of compressors, pumps, rock drills, and air tools, will be combined with four present subsidiaries of Dresser to form a new wholly-owned subsidiary of Dresser Industries, known as Gardner-Dresser Company. G. V. Leece, chairman and president of Gardner-Denver, will be chief executive officer of the newly-formed subsidiary.

The companies that will form Gardner-Dresser, in addition to Gardner-Denver, are Clark Brothers Co., Olean, N. Y.; Pacific Pumps, Inc., Los Angeles; Root-Connersville Blower Co., Connersville, Ind.; and Ideco, Dallas, Tex.

Dresser produces equipment and provides technical services for the oil, gas, and chemical industries.

The Waukesha Motor Company, Waukesha, Wis., has announced its outright purchase of the complete plant and assets of the Climax Engine Manufacturing Company of Clinton, Iowa, manufacturer of internal combustion engines.

Waukesha manufactures heavy-duty diesel, gas, and gasoline engines. The addition of the Climax line of gas engines ranging up to 600 hp. will give Waukesha complete coverage in a power range up to approximately 1,200 hp.

ROBERT CAMPBELLO has been named vice-president of Continental Copper & Steel Industries, Inc., New York, N. Y. In this capacity, Mr. Campello will also be general manager in charge of operations of the company's Wooldridge Manufacturing Division plant at Sunnyvale, Calif.

Associated with the excavating industry since 1929 in both distributor and manufacturing organizations, Mr. Campbello moves to Continental from the Marion Power Shovel Company where he was vice-president in charge of sales, parts, and service.

The Smith Engineering Works, Milwaukee, Wis., has appointed WILLIAM S. SHIRA assistant chief engineer. In his new position, Mr. Shira is in charge of the engineering department under A. L. Munro as director of engineering.

Mr. Shira had been with the Allis-Chalmers Manufacturing Company in its processing machinery department since 1940.

W. S. Shira

G. E. Thorn

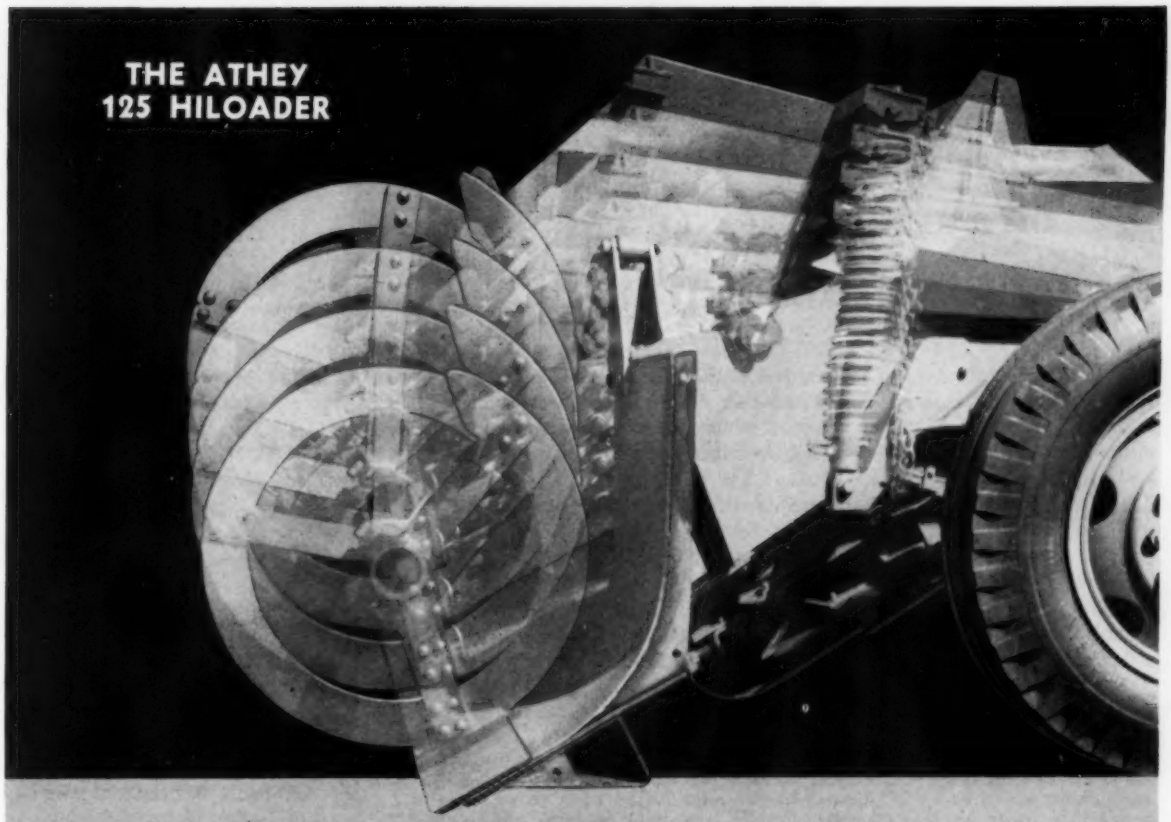
Appointment of GORDON E. THORN as Central States regional manager for Hercules dump bodies and hydraulic hoists has been announced by Hercules Galion Products, Inc., Galion, Ohio.

As regional manager for Hercules, Mr. Thorn will be responsible for sales and other related activities in a seven-state area which includes Ohio, Indiana, Illinois, Iowa, Michigan, Wisconsin, and Missouri.

Take-it-Away is the title of a new 16 mm. sound film released by the Macwhyte Company. The film shows how to handle loads safely through the air—it explains how the rated capacity of a sling will vary due to stresses caused by the various methods of applying the sling to the load.

The film may be obtained on a loan basis by writing to Forest J. Nelson, Public Relations Manager, Macwhyte Company, Kenosha, Wisconsin.

E. PAUL MONROE, president of Hercules Galion Products, Inc., Galion, Ohio, celebrates this year his golden anniversary with the company. Long active in the truck equipment business, he is widely recognized as a pioneer of new developments and ideas in his field.



PATENTED FULL-FLOATING FEEDER...

secret of the fastest loader in the field!

We stopped the exclusive Athey Full-Floating Feeder in motion to show you the principle that makes the 125 HiLoader the leader in the loading field! You can see how the spring-suspended feeder floats freely, rising and falling with the contour of the windrow or stockpile.

Feeder blades automatically adjust to any material . . . rock, dirt, gravel, broken pavement, quarry materials . . . permitting it to flow onto the fast moving belt.

Extra large throat opening cannot restrict the material; allows steady, uniform loading without plugging up or slowing down.

The full-floating feeder is but one of many reasons why more successful men with a tough materials handling problem specify the Athey 125 HiLoader to cut their costs and boost their profits!

Take a tip from them . . . see your Athey Dealer for all the details!

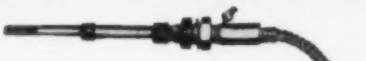
ATHEY HILOADER

- Loading capacity up to 10 cu. yds. per minute
- Swiveling conveyor speeds truck spotting
- Travels from job to job at 20 M.P.H.

Athey

ATHEY PRODUCTS CORPORATION
5631 West 65th Street, Chicago 38, Illinois

TRU-LAY *flexible* PUSH-PULLS FOR Remote Control Jobs on a great variety of Construction Equipment



Adaptability to all sorts of mechanical situations explains, in large measure, the wide-spread use of TRU-LAY PUSH-PULLS on tractors and their accessories, power shovels, winches, road graders, road oilers, dump trucks, snow plows, engine-driven pumps, rock crushers and other construction equipment.

These dependable Push-Pulls are used for the remote control of hydraulic and air valves, brakes, clutches, transmissions, throttles, chokes, governors, power take-offs, and many other applications.

TRU-LAY PUSH-PULLS are precision products, not gadgets. They provide positive remote-action whether anchorages are fixed or movable . . . for light loads or loads up to 1,000 lbs. . . . and they are effective over short or long distances, up to 150 feet or more.

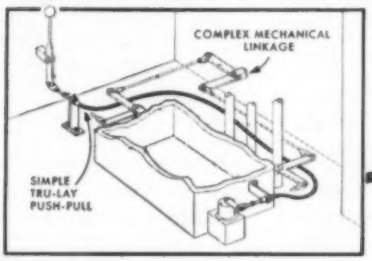
TRU-LAY PUSH-PULLS are dependable and accurate even under the most adverse conditions

They perform effectively under extremes of heat or cold . . . from jet engine temperatures to 70° below zero F. The inner, working member (lubricated for life during assembly) is fully protected by the tough, flexible conduit. Abrasive dusts, dirt and moisture are sealed out. Fittings are cold-swaged to make them integral parts of the control unit. It is a matter of record that we have never heard of a TRU-LAY *flexible* PUSH-PULL wearing out in normal service. Use of these versatile, simple and rugged controls increases ease of operation and means the virtual elimination of maintenance.

Advantages of Tru-Lay Push-Pull flexibility and simplicity are pictured below

Simplicity vs Complexity

Compare the TRU-LAY PUSH-PULL cable in illustration with the mechanical linkage. PUSH-PULLS are simple, have but one moving part, are noiseless and give lifetime service accuracy. Linkages are complex, made of many parts; they wear at many points. Their use brings increased backlash, lost accuracy and vibration rattles.



"Solid as a rod but *flexible* as a wire rope" is a good description of TRU-LAY PUSH-PULL REMOTE CONTROLS. This flexibility makes it possible to snake around obstructions . . . permits the ideal arrangement of all control elements . . . greatly simplifies installation of controls by reducing the number of working parts . . . damps out noise and vibration. Versatile, accurate, adaptable, rugged . . . they are the ideal remote controls for construction equipment.

Our DATA FILE will answer your further questions
Write for a copy without obligation

ACCO

AUTOMOTIVE and AIRCRAFT DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

601-K Stephenson Bldg., Detroit 2
2216-K South Garfield Ave., Los Angeles 22 • 929-K Connecticut Ave., Bridgeport 2, Conn.

Appointment of C. E. FLORA as manager of industrial sales, Davey Compressor Company, Kent, Ohio, has been announced. In his new capacity, Mr. Flora will be in charge of all relations with the company's world-wide network of industrial distributors. He will direct sales of Davey Hydrovane rotary stationary units and tank mounted rotary compressors.

Prior to joining Davey, Mr. Flora was compressor division manager, Binks Manufacturing Co., Chicago, Ill. He also served as general sales manager of the Compressor Engineering Company, Chicago.

C. E. Flora

U. Hipp

URBAN HIPP has been named to succeed JOHN M. SPENCE as treasurer of Barber-Greene, Aurora, Ill. Mr. Spence, treasurer since 1945, now moves to the newly-created post of manager of insurance.

Mr. Hipp came to Barber-Greene in 1939. In 1954, he was elected assistant treasurer and an officer of the company, and has retained this position until his present election to the post of treasurer. He has been a director and secretary and treasurer of the Barber-Greene subsidiary export companies since 1952.

EUGENE F. DAILY, who has been manager of the San Francisco explosives sales district for the Atlas Powder Company, Wilmington, Del., was named western construction manager for the company's Explosives Sales Department.

Succeeding Mr. Daily as San Francisco manager is JAMES M. ELLIS, who was formerly assistant manager.

James H. Robins, president of The American Pulley Company, Philadelphia, Pa., has announced a 16-year license agreement with William Kenyon & Sons, Ltd., of Dukinfield, Cheshire, Eng., for the manufacture and sales of American power-transmission products in England for distribution in the British Commonwealth, excepting Canada.

It's a big-producing 2½-yd. LORAIN-85A for Fiala Crushed Stone

This Annville, Pennsylvania, quarry of Fiala Crushed Stone Corporation uses three Lorain Shovels for digging and truck loading to keep crusher output at a maximum. One of them is its new 2½-yd. Lorain-85A. To date, 9 Lorains have been purchased by Fiala.

Fiala knows the value of productivity and performance . . . that's why it chose the big Lorain-85A. It is a standout in any quarry. Here's what it offers:

BIG POWER—"Never-say-die, hang-on" power—that's what the Lorain-85A has with its torque converter that automatically matches engine torque to digging demands.

SIMPLE POWER CONTROLS—Lorain 2-lever, "Joy Stick" air power controls—reduce effort, reduce fatigue—increase speed, comfort and production.

NEW TURNTABLE MOUNTING—"Shear Ball" turntable mounting . . . like a huge, sealed "ball bearing" . . . eliminates all rollers, exposed roller path, center pin and nut with their constant requirements of adjustment and maintenance.

TWO CRAWLER CHOICES—One 15′ 6″ long x 11′ 10″ wide for general purpose service as shovel, crane, dragline or hoe. One extra-long and extra-wide—18′ 6″ x 14′ 2″—for maximum lifting capacities as a crane and for wide-radius dragline and clamshell work.

NEW CAB—New "operator-designed" cab for greater visibility, comfort, convenience—less fatigue.

These are a few of the features that make the Lorain-85A a big-profit machine. Your Thew-Lorain Distributor can tell you the whole story.

THE THEW SHOVEL CO., LORAIN, OHIO

THE THEW LORAIN®

You pay less for this stronger thread for bags

"SUPER CORDURA" SEWING THREAD reduces bag breakage resulting from rugged handling, because seams are much stronger.

"SUPER CORDURA" can be sewn with smaller needles, preventing material losses caused by sifting.

HIGHLY EFFICIENT "SUPER CORDURA" REG. U. S. PAT. OFF. REDUCES BAG AND CLOSING COSTS

GREATER seam strength, increased sewing efficiency, lower cost—these are the advantages of sewing bags with Du Pont "Super Cordura"* high tenacity rayon.

Because "Super Cordura" is far stronger than ordinary-fiber threads, danger of seam breakage is minimized—drop tests prove it. And because sewing with "Super Cordura" is more efficient, you save money in your closing operations. There are less breaks during closing; one thread does most jobs, reducing thread inventory.

Consider the advantages of bags sewn with Du Pont "Super Cordura" the next time you order multiwalls . . . and order it for use in closing, too.

E. I. du Pont de Nemours & Co. (Inc.), Textile Fibers Department, Wilmington 98, Delaware.

*"Super Cordura" is Du Pont's registered trademark for its high tenacity rayon yarns.

DU PONT
REG. U. S. PAT. OFF.
Better Things for Better Living . . . through Chemistry

THREAD OF "SUPER CORDURA"... easier to sew ... costs less than conventional thread ... extra-strong

FREDERICK W. BRENNION has been named district manager for the Boston Woven Hose & Rubber Company, Cambridge, Mass. His district includes the states of Maine, New Hampshire, Vermont, and portions of Massachusetts and New York State.

J. BARRIE GRAHAM has been promoted to the position of director of research of the Buffalo Forge Company, Buffalo, N. Y. Mr. Graham joined the company in 1953 as associate director of research.

RICHARD D. MADISON, formerly director of research, has been appointed consulting engineer to the company. Mr. Madison joined the engineering staff of Buffalo Forge Company in 1919.

Officials of The J. B. Ehrsam & Sons Manufacturing Company, Enterprise, Kans., have appointed DEAN L. BRANT to direct the company's newly-established sales office in Erie, Pa.

Mr. Brant will serve the northeastern states of New York, Pennsylvania, and Ohio, and the New England states. He brings an extensive range of sales and service experience to his new assignment, including several years in traveling both the eastern and western coastal areas.

D. L. Brant

R. E. Young

R. E. YOUNG has been named to the newly-created position of special representative for the Electric Excavator Division of the Harnischfeger Corporation, Milwaukee, Wis. Mr. Young will concentrate his activities on expanding the markets for the company's line of large electric shovels.

During his 41 years with P&H, Mr. Young has been closely associated with the heavy mining industry and more particularly with the open pit operations in which electric excavators find their greatest application.

Ore processing called for stout "muscles"

Iron-shod stamps relieved men of the back-breaking task of crushing ore with a hammer. But these primitive replacements for muscle power required long and tedious workmanship, were clumsy and difficult to operate and still produced only small quantities.

Today's ore processing plants use the muscle power of efficient grinding mills to turn out many tons of processed ore per day. Many mill users specify and insist upon CF&I Grinding Balls and Rods for their mills because the steel has the ideal toughness-hardness balance that assures optimum grinding ability plus maximum wearability.

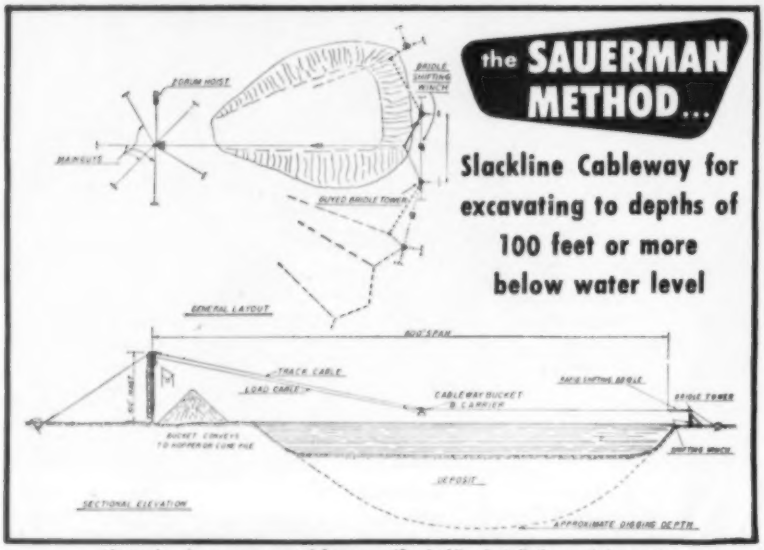
5098

THE COLORADO FUEL AND IRON CORPORATION

Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Casper • Chicago • Denver • Detroit
El Paso • Ft. Worth • Grand Junction • Houston • Kansas City • Lincoln (Neb.) • Los Angeles • New Orleans • New
York • Oakland • Oklahoma City • Philadelphia • Phoenix • Portland • Pueblo • Salt Lake City • San Antonio
San Francisco • San Leandro • Seattle • Spokane • Wichita

CF&I

HOW TO GO UNDER WATER AND GET ALL THE MATERIAL FROM YOUR DEPOSIT


the SAUERMAN METHOD...
Slackline Cableway for excavating to depths of 100 feet or more below water level
GENERAL LAYOUT
SECTIONAL ELEVATION
DEPOSIT
APPROXIMATE DIGGING DEPTH

Above drawing was prepared for a specific slackline installation and does not represent maximum spans. Rapid shifting bridle is not needed for many deposits.

Cableway at Cabinet Gorge Dam digs and hauls from tailrace 1000 ft. away. **(Full details in Sauerman News No. 143.)**

New York gravel producer switched to cableway for underwater operation of his pit. Average haul is 600 ft. from a 50-ft. depth **(Sauerman News No. 141).**

Deposits below water yield new profits with a long reaching Sauerman Slackline Cableway. On job after job this machine has proved to be the most efficient for this type of operation. It is especially effective where the material to be excavated has good depth and will flow to the bottom of the cut. For shallow deposits or non-caving material a rapid shifting device is used to change the line of operation.

One man controlling the hoist digs, conveys and elevates from deposit to plant over spans of 1000 ft. or more . . . across streams, lakes, bogs or deep pits. The powerful load line pull insures digging penetration. Tensioning the track cable lifts the bucket which is inhauled at high speed and dumps automatically. Gravity return completes the fast operating cycle. Bucket capacities range from ⅓ to 3½ cu. yds.

To get fast, economical long range excavation, and the shortest, most direct way from pit to pile use a slackline cableway. Contact Sauerman for specific recommendations. No obligation. Request Catalog C, showing detailed specifications and photos of slackline cableways in action on all types of deep digging jobs.

SAUERMAN BROS. INC.

634 S. 28th AVE. | BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

F. W. Jenks

P. V. Moulder

FRANK W. JENKS, formerly executive vice-president of the International Harvester Company, Chicago, Ill., was elected president of the organization. Mr. Jenks succeeds PETER V. MOULDER, who has retired as president and has resigned from the board of directors.

Mr. Jenks joined International Harvester in 1914. He came to the general office in Chicago in 1928, becoming manager of the credit bureau in 1933; manager of the credit and collection department in 1941; vice-president, merchandising services, in 1944; and executive vice-president in 1956. He has been a director since 1952.

Mr. Moulder's retirement brings to a close a career of 47 years with the International Harvester Company. He started his career with the firm as a salesman in Denver, and later was transferred to New York as motor truck district manager. In 1944 he became general manager of the Motor Truck Division. He was elected executive vice-president in 1946, a director in 1948, and president in 1956.

HOMER W. COLEMAN, manager of explosives operations for the Hercules Powder Company, Wilmington, Del., has been named manager of the Explosives Department sales office at Birmingham, Ala.

JOHN H. SHARDA has been promoted to the position of sales training manager for the LeTourneau-Westinghouse Company, Peoria, Ill. Mr. Sharda, who joined LeT-WesCo in 1942, has served for the last five years as district representative for the company in Illinois and Indiana.

Denver Equipment Company, Denver, Colo., has appointed the Robert J. Weber Company, 75 College Avenue, Rochester, N. Y., as exclusive dealer for Denver pumps in the northern counties of New York state.

Meet a Packaging Problem -Solver

Years of experience in the Multiwall field, backed by vast paper resources and extensive manufacturing facilities, assures you a *practical* answer to your packaging problems. Let a Raymond Representative show you how with a Raymond Multiwall!

Raymond BAG CORPORATION

Division of Albemarle Paper Mfg. Co.

MIDDLETOWN, OHIO • RICHMOND, VIRGINIA

Announcing

TERRIFIC Used Equipment BARGAINS

See

PIT & QUARRY'S Broadcast Section Pages 183-191

Auto-Vortex Classifiers are delivering sharp gradations and recovering fines . . . at lower operating costs . . . in hundreds of installations all over the country.

CHARLES E. WOOD CO.

AUTO VORTEX CLASSIFIERS

906 N. WATER ST. • MILWAUKEE 2, WIS.

WE'D LIKE TO SOLVE *YOUR* CLASSIFICATION PROBLEMS. WRITE TODAY!

Consult

CAROLINA TIRE CO.

232 N. MAIN ST.
SALISBURY, N.C.

. . . save 50% with our BIG TIRE Recapping Service

HARD ROCK LUG SIZES 1100x24 THROUGH 33.5x33

GOES AS FAR AS A NEW TIRE

•

COSTS ONLY HALF AS MUCH

A call on CAROLINA will cut your big tire costs per mile and per ton!

We go anywhere, anytime, to pick up worn casings, and return them reconditioned to give you the *same* use as a new tire . . . at 50% off! On-the-job service is also available.

Scores of testimonial letters from contractors and quarry and strip mine operators attest the profit-boosting quality of CAROLINA Service.

We have more than 2000 service operators "on duty" in 30 states and some foreign countries.

We have earthmover tire bargains galore.

Write for information

CAROLINA TIRE COMPANY

232 N. MAIN ST. • SALISBURY, N.C. • PHONE 5200

Portable VEHICLE SCALES

weigh anything ...anywhere!

Here's the perfect portable vehicle scale . . . rugged, self-contained, easy to install and move, no pit required . . . accurate!

Capacities from 20 to 70 tons—lengths from 20 to 60 feet. Individual sections can be joined with *just 8 bolts* for greater length and capacity.

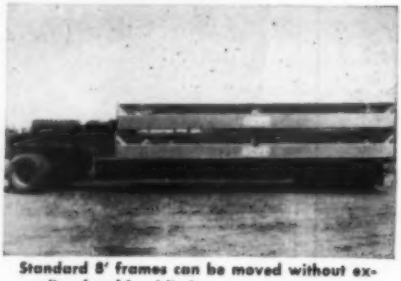
And you can select any weight indication—full capacity beam, type recording beam for printed records, or attachable Weightograph® for direct enlarged visual readings.

All this *plus* the extra ingredient—a solid century of scale skill built into every Howe Scale. Don't settle for less.

PORTABLE VEHICLE SCALE FOLDER ▶

Write today for this folder giving complete details and specifications on Howe Portable Vehicle Scales.

Each section a complete scale—easily joined for greater length and capacity.



Standard 8′ frames can be moved without exceeding legal load limits.

CENTENNIAL 100 YEARS HOWE 1857 1957

The HOWE SCALE Co
A SUBSIDIARY OF SAFETY INDUSTRIES, INC,
RUTLAND · VERMONT

RUSSELL HAWK, advertising manager of the Fuller Company, Catasaugua, Pa., for the last 22 years, has retired.

Before joining the Fuller Company as advertising manager in 1935, Mr. Hawk had served in the advertising department of the Babcock and Wilcox Company.

R. Hawk

D. A. Peterson

Appointment of DON A. PETERSON as works manager for Gar Wood Industries' new truck equipment plant in Exeter, Pa., in the Scranton area, has been announced. Mr. Peterson will transfer from Gar Wood's executive offices in Wayne, Mich., to offices in Exeter upon completion of the new plant.

CLESSIE L. CUMMINS has retired as honorary chairman of the board and as a director of Cummins Engine Company, Inc., Columbus, Ind.

Mr. Cummins, now 68, founded the company which bears his name in 1919, and served as its president from 1919 to 1947. He served as chairman of the board from 1947 to 1951, and as honorary chairman since that date.

C. L. Cummins

H. H. Bloom

HERBERT H. BLOOM, former president of Massey-Harris-Ferguson, Inc., has been elected president of J. I. Case International, S.A., a newly-organized, wholly-owned subsidiary of the J. I. Case Company, Racine, Wis.

In addition to heading overseas operations, Mr. Bloom will supervise Case's further expansion in Canada.

PETER KIEWIT SONS' CO. produces:

Aggregate and mineral filler for bituminous surface course

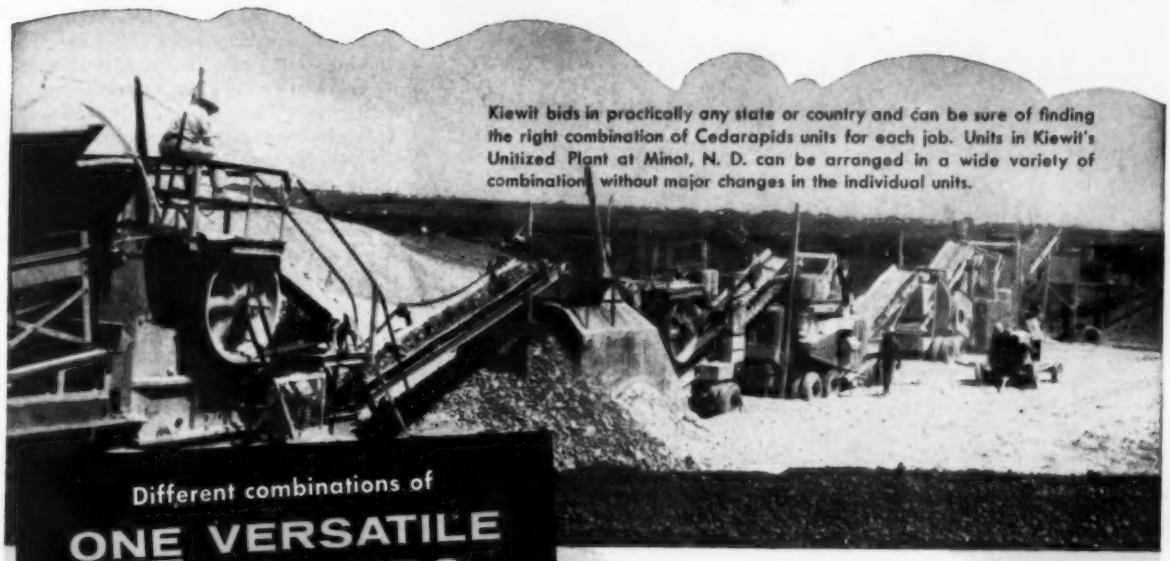
In one arrangement of Cedarapids Units, large size pit material is initially crushed by a 2540 Portable Primary Jaw Crusher and further reduced by an 1836 Primary Jaw. Material then goes through an Intermediate Roll Crusher Scalping Unit and finally a Roll Crusher Secondary Plant. With this efficient combination of Cedarapids units, Kiewit produces minus ⅜" fine aggregate containing rock dust mineral filler, and ¾" surface course aggregate.

Three sizes of aggregate for concrete and binder course

In a different combination of units, the same Cedarapids Unitized Plant produces 1½" concrete aggregate, ¾" concrete aggregate, 1" hot-mix binder course aggregate.

Washed aggregate

From stockpile and double log washer, a Cedarapids 24" x 50' Conveyor delivers aggregate to a Cedarapids 4' x 12' triple-deck Horizontal Vibrating Screen installed over the loading bin and equipped with spray bars for final washing.



Kiewit bids in practically any state or country and can be sure of finding the right combination of Cedarapids units for each job. Units in Kiewit's Unitized Plant at Minot, N. D. can be arranged in a wide variety of combinations without major changes in the individual units.

Different combinations of

ONE VERSATILE CEDARAPIDS UNITIZED PLANT

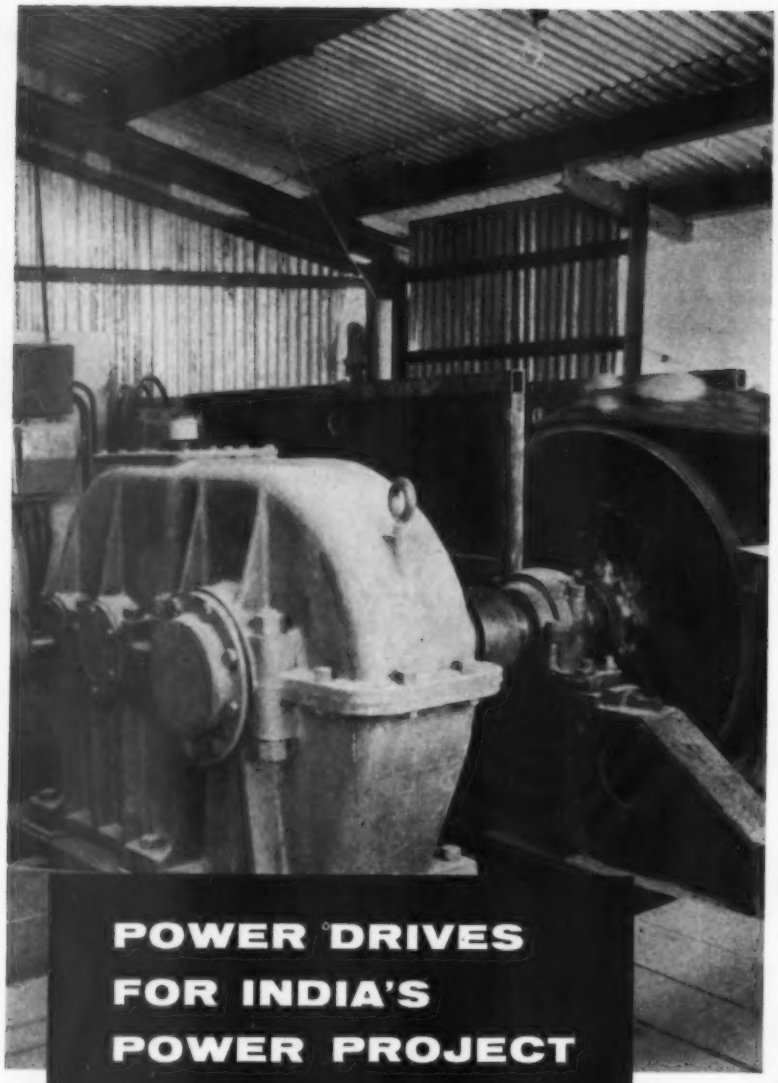
supply many sizes of concrete and hot-mix aggregates for Minot Air Force Base

The flexibility of this Cedarapids Unitized Plant, and the contractor's ingenuity in varying the unit combinations to meet specifications for both concrete and hot-mix aggregate, assure maximum efficiency at low production cost.

There's a combination of Cedarapids crushing, screening, scalping and washing units that will solve your problem by producing almost any quantity, any specification, and meet practically any production condition. And remember, 100% portability lets you take them where the best contracts are. Ask your Cedarapids distributor to explain Unitized operation and show you how you'll profit.

Cedarapids Built by IOWA

IOWA MANUFACTURING COMPANY Cedar Rapids, Iowa, U. S. A.



India is harnessing the mighty Sutlej River with the $125 million Bhakra Dam to provide power and irrigation for the Punjab area. Twenty-five Jones Herringbone Speed Reducers drive 51 Hewitt-Robins belt conveyor units used to carry aggregate over three miles of extremely rugged terrain and two miles through processing operations.

Jones Power Drives were specified because their quality construction assured continuous operation. To find out how Hewitt-Robins products and services can help you, consult your classified telephone directory for the nearest Hewitt-Robins representative, or contact Hewitt-Robins, Stamford, Conn.

HR HEWITT-ROBINS

CONVEYOR BELTING AND IDLERS . . . POWER TRANSMISSION DRIVES
INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

F. H. Ueckermann

H. L. Truitt Jr.

FRED H. UECKERMANN has been named Chicago district manager, wire rope division, John A. Roebling's Sons Corporation, Trenton, N. J. Mr. Ueckermann, who for the last eight years has headed Roebling's Atlanta, Ga., district office, has represented the firm in various sales capacities for 22 years.

HARRY L. TRUITT JR. replaces Mr. Ueckermann at Atlanta. He has been a sales representative in the Florida territory for the last five years.

Western Precipitation Corporation, Los Angeles, Calif., has announced the appointment of EDWARD R. LAWLOR as product sales manager for world-wide sales of Multiclone dust collectors.

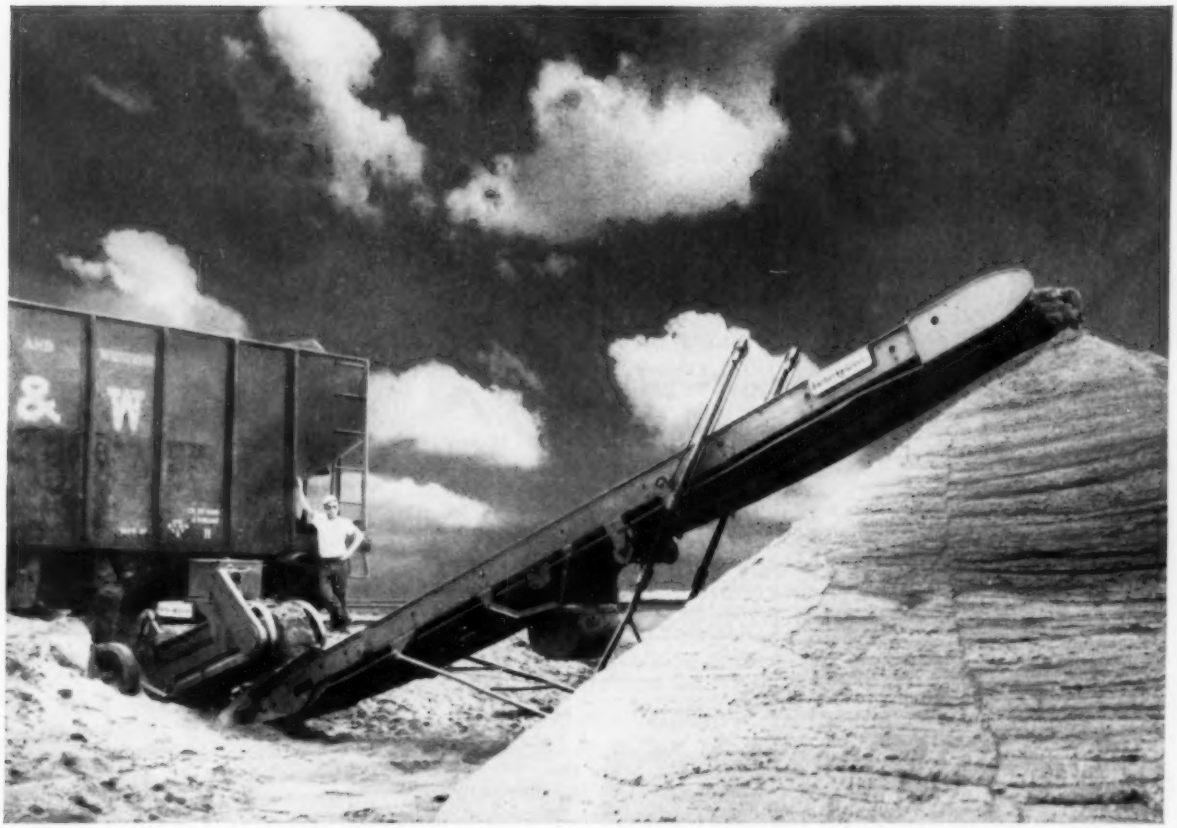
In his new duties, Mr. Lawlor will be responsible for the co-ordination and distribution of technical, engineering, and sales data to all Multiclone field personnel, for co-operation with the field personnel and agents in the engineering and installation of Multiclone applications, and in the development of new uses for the equipment.

E. R. Lawlor

A. W. Escoffier

ALFRED W. ESCOFFIER, service engineer at Thor's San Francisco branch since 1955, has been appointed manager of the Seattle branch of the Thor Power Tool Company, Chicago, Ill.

Mr. Escoffier will be headquartered at the Seattle branch's new location at 414 Eighth Avenue N., where Thor operations recently were moved to provide more space for modern repair and service facilities.



Ohio contracting firm, S. E. Johnson Co., reports:

"We unload the largest hopper cars in 45 minutes"

"Our Barber-Greene unloader and conveyor easily handle 800 tons a day with just intermittent operation. So far, we have moved over 85,000 tons of material and have had no maintenance expense to speak of."

This statement isn't a manufacturer's specification; it is a factual, unvarnished, report typical of the many comments on outstanding performance of Barber-Greene car-unloading equipment.

Wherever it's used, the combination of the 363 Portable Conveyor and the 358 Car Unloader provides a sure way to cut unloading costs and to release cranes and other, more expensive equipment for more efficient operation on other jobs. Whatever these Barber-Greenes handle—coal, sand, gravel or other bulk materials—they do the job virtually automatically as a one-man operation.

Both conveyor and unloader are mounted on pneumatic tires for easy maneuvering about the yard . . . for fast between-job towing at truck speeds.

B-G Unloader operates above or below the rails. Portable conveyor can be equipped with screens, power hoist and other accessory equipment. Capacity ranges to 150 t.p.h. Powered by gas or electricity.

56-13-PO

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

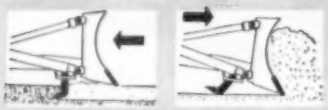
CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

These Preco Back-Rippers, mounted on the reverse side of the bulldozer moldboard, dig in and rip **while the tractor backs up.** They make blading easier and faster because they rip out rocks, roots and hard ground, enabling the tractor to work a full blade with less horsepower on its next trip. This is **double-duty bulldozing.**

Like contractors all over America, you can save time and money by using Preco Back-Rippers in building pioneer roads, clearing land and rights-of-way, in gravel pit operations, slate breaking in coal strip mines, for logging operations and mounted on pusher tractors for faster scraper loading.

See your Caterpillar Dealer or send the coupon for information.

BACK UP RIPPING **EASIER FORWARD DOZING**



Preco Back-Rippers are completely automatic in operation — they dig in on the back-up trip and ride on the surface when going forward. There are no controls and, when desired, they can be locked up out of the way.

PRECO INCORPORATED
6300 E. Slauson Avenue
Los Angeles 22, Calif.

Please send information on Preco Back-Rippers.

Name_____

Address_____

The Colorado Fuel and Iron Corporation has prepared a new booklet describing its 14 sound-color motion pictures which are available on a free loan basis. The films describe various aspects of mining, steelmaking, and the manufacture of finished steel products.

The 16 mm. films have running times of from 15 to 38 minutes. The descriptive booklet includes complete instructions on how these films can be obtained, and is available by writing to The Colorado Fuel & Iron Corporation, P. O. Box 1920, Denver 2, Colo.

The appointment of HARRY E. FOULKROD as assistant to the vice-president in charge of sales, Fruehauf Trailer Company, Detroit, Mich., has been announced. Mr. Foulkrod was previously Fruehauf's regional sales manager in the southwestern area, covering the states of Texas, Oklahoma, Kansas and New Mexico.

Promotion of MARTIN J. SWEENEY to the position of manager of the Pittsburgh sales division of The General Tire & Rubber Company, Akron, Ohio, has been announced. The Pittsburgh sales division includes the western portions of the states of Pennsylvania and New York and part of Maryland.

M. H. PRYOR has relinquished the presidency of the Barnes Manufacturing Company, Mansfield, Ohio, to become chairman of the board of directors. FRED B. HOUT, vice-president-sales for the last 12 years, was named president of the firm, succeeding Mr. Pryor, who has held the post since 1939.

Bucyrus-Erie Company, South Milwaukee, Wis., has named the Power Shovel Company, Indianapolis, Ind., distributor of excavators and cranes in all of Indiana, with the exception of Lake, Porter, and La Porte counties and the bottom two tiers of counties along the Ohio River.

Directors of the Westinghouse Air Brake Company, Pittsburgh, Pa., have announced the election of EDWIN HODGE JR. as chairman of the board. Mr. Hodge has been a director of the firm since 1949, and was elected chairman of the executive committee in 1955.

W. L. Wearly

A. B. Drastrup

WILLIAM L. WEARLY was elected president of the Joy Manufacturing Company, Pittsburgh, Pa., succeeding JOHN LAWRENCE, who has resigned. A. B. DRASTRUP was elected executive vice-president to fill the position formerly held by Mr. Wearly.

Mr. Wearly has been with the company for 20 years, starting his career in the operating department of the company's Franklin, Pa., plant. He later became vice-president in charge of sales, and for the last two years has been executive vice-president.

Mr. Drastrup has been manufacturing vice-president and assistant to the president. In addition, he has worked in administration of the company's foreign subsidiaries and overseas operations.

E. P. BERG, general manager of the Pershing Road Plant of the Link-Belt Company, Chicago, Ill., has been elected president of the Conveyor Equipment Manufacturers Association, succeeding J. H. Walker, president, Fairfield Engineering Co., Marion, Ohio.

Other new officers are: vice-president, J. B. Nordholt Jr. (president, Webster Manufacturing, Inc., Tiffin, Ohio); treasurer, H. E. Murken (manager, conveyor sales, Hewitt-Robins, Inc., Stamford, Conn.); and secretary, L. J. Johnson (general sales manager, Mathews Conveyor Co., Ellwood City, Pa.).

JOHN F. VAN DAM, formerly production manager, has been appointed to the newly-created post of Los Angeles works manager of the Peerless Pump Division, Food Machinery and Chemical Corporation, Los Angeles, Calif.

THOMAS E. TURNER has been appointed a sales representative for the Leschen Wire Rope Division, H. K. Porter Company, Inc., New York, N. Y. His territory includes Virginia, West Virginia, and North Carolina.

H&L

Teeth that really dig!

Pat. No. 2,568,075
Pat. No. 2,669,153

H&L TOOTH COMPANY

1540 South Greenwood Avenue Montebello, California

DREDGE SLEEVE CLAMPS

Sturdy • Practical • Dependable • Economical

Furnishes a positive seal for round flexible joints. Used by leading dredging and hydraulic sand-and-gravel operators, and the U.S. Engineering Corps. This Multi-use chain sleeve clamp is easy to apply... positive in action. Write for illustrated folder, today.

THE BLACK BROTHERS CO., INC.
9th Ave. at 4th, Mendota, Illinois

Hendrick, Pioneer Perforator of special quality steels for over 81 years, can really cure your vibrating screen problems! Hendrick's wide experience in selecting and specifying the best analysis of steel for the aggregates industry plus their unlimited experience in perforating plate gives you a combination **1+1=2** that can't be beaten! Hendrick Perforated Plate not only stands up longer, but affords more accurate sizing. No other screening medium can compare to it for maintained uniformity of mesh, for non-blinding clearance and for long trouble-free life. For details write to Hendrick, today!

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring—Shur-Site Treads • Armorgrids • Hydro Dehazers • Petrochemical Column Internals

Hendrick MANUFACTURING COMPANY
39 DUNDAFF STREET
CARBONDALE, PA.

EXTREMULTUS belts ABSORB SHOCK and VIBRATION

EXTREMULTUS is the revolutionary new power transmission belting that combines the shock absorbing properties of an elastic, incredibly strong core of polymer with the unexcelled friction surface of specially chrome tanned leather. In addition to absorbing shock and vibration, EXTREMULTUS will not stretch on fixed centers, runs at speeds over 10,000 feet per minute, and carries loads up to 6,000 H.P.! Write today for descriptive catalog.

EXTREMULTUS, INC.
405 LEXINGTON AVE., NEW YORK, N. Y.

THOMAS ROBINS, 89, founder and former chairman of Hewitt-Robins, Inc., Stamford, Conn., and inventor of the heavy-duty belt conveyor now used extensively to transport ore, coal, and other bulk materials, has died after an illness of several months.

Mr. Robins founded the Robins Conveying Belt Company in 1896. The company was merged with the Hewitt Rubber Company in 1945 to form Hewitt-Robins, Inc. Today Hewitt-Robins has six manufacturing plants in the United States and one in Johannesburg, South Africa.

Recent changes in the district offices of The Lincoln Electric Company, Cleveland, Ohio, have been announced.

BRUCE N. FRYE has been transferred from Atlanta, Ga. office to Columbus, Ohio; EDWIN WILLIAMS was transferred from Atlanta to Birmingham, Ala.; and GERALD R. STOECKINGER has joined the Lincoln Electric's district office in Los Angeles, Calif.

The New York district sales office of the Refractories Division of The Babcock & Wilcox Company, New York, N. Y., has been moved from its 42nd Street location to 135 Cedar St., New York.

The Augusta, Ga., district sales office of the Refractories Division has also moved to a new location at 725-31 Broad St., Augusta.

EARNEST J. BOLDUC was named New England district sales manager for the Wickwire Spencer Steel Division of the Colorado Fuel and Iron Corporation, Denver, Colo. Mr. Bolduc, whose office is located at the company's New England headquarters in Boston, Mass., has been associated with Wickwire Spencer Steel since 1920. Until his recent appointment, Mr. Bolduc was Coburn sales manager.

The Chrysler Corporation, Detroit, Mich., has named the following new industrial engine dealers:

Service Motor Parts & Supply Co., 1812 Paxton St., Harrisburg, Pa.; Klug Farm Equipment, Eau Claire, Mich.; DiPietro-Kay Co., 932 New Britain Ave., West Hartford, Conn.; and Clark Dodge Truck Co., 624 N. Virginia, Oklahoma City, Okla.

Personnel changes in the Mid-Atlantic Region of the Industries Group of the Allis-Chalmers Manufacturing Company, Milwaukee, Wis., have been announced as follows:

C. W. PARKER JR., manager of the Richmond, Va., district since 1955, has been appointed manager of the Philadelphia, Pa., district, succeeding A. D. BROWN, who has been transferred to the regional office staff.

J. M. MATHEWS has been named successor to Mr. Parker as manager of the Richmond district. He had been manager of the Charleston, S. C., district since 1948.

GORDON HOOD, a former sales representative in the Baltimore, Md., district, has been appointed manager of the Charleston district, succeeding Mr. Mathews.

Motion pictures prepared and distributed on a free loan basis by the United States Steel Corporation are fully described in a catalog which will be sent on request to U. S. Steel, 525 William Penn Pl., Pittsburgh 30, Pa.

The booklet includes the addresses of U. S. Steel film distribution centers, instructions for ordering films, and convenient order blanks.

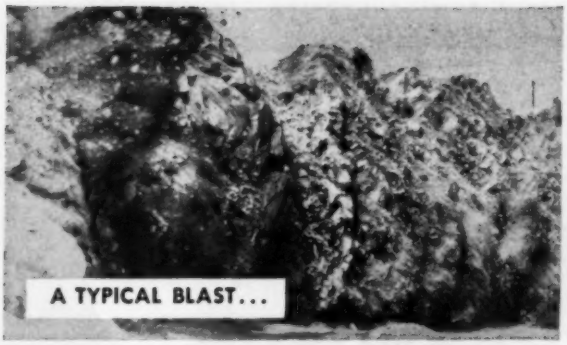
DONALD W. MILLER has been advanced to the post of sales engineer in the Detroit, Mich., sales office of the Wheelabrator Corporation, Mishawaka, Ind. He has been a sales and service engineer in that office since joining the company in 1954.

Also appointed sales engineer in the Detroit territory is FRED H. SMITH, who has been a sales and service engineer in that territory since 1953.

WAYNE W. CLEMENTS and ANDREW JOYE have been assigned to the Detroit territory as sales and service engineers.

RUSSELL U. BARTON, an eastern representative for the Four Wheel Drive Auto Company, Clintonville, Wis., has been named the outstanding district sales manager of the FWD sales organization for 1957.

Mr. Barton, a veteran of 23 years with FWD, represents the company in eastern New York and part of Pennsylvania. He joined the FWD sales staff in 1934, became New York branch manager in 1942, and was named a district sales manager in 1952.



Compare the Costs of a Blast Like This:

SPENCER A/N MIXTURE — 6¢ lb.

LIQUID OXYGEN EXPLOSIVES — 9¢ lb.

COMMERCIAL A/N BLASTING AGENTS — 13.5¢ lb.

COMMERCIAL DYNAMITES — 18¢ lb.

BIGGER BLASTS AT LOWER COST — that's the story reported by strip miners and quarry owners who have tried the new blasting method with Spencer Prilled Ammonium Nitrate. Savings up to 50% are common.

BETTER FRAGMENTATION — BIGGER PROFITS! Actual field tests show that the new blasting method developed with Spencer Prilled Ammonium Nitrate commonly produces about 25% better fragmentation.

Technical investigation reports: New blasting process has . . .

"Better Explosive Characteristics and Meets Best Overall Requirements..."

Take advantage of Spencer Chemical Company's offer of free technical advice and service. Pioneer in new process, Spencer has extra know-how about nitrate types, packing, detonation.

A new, low-cost blasting method, developed by Maumee Collieries, using Spencer Prilled Ammonium Nitrate, was first announced to the public about two years ago. At this time Spencer reported that this new method cut blasting costs about 50% and moved about 25% more material. Since this time Spencer has pioneered this new, low-cost blasting method all over the world.

More intensive tests reinforce these impressive figures. For example, a West Virginia coal stripper states: "The results of our collaborative investigation leave little doubt that ammonium nitrate has the better explosive characteristics and meets the best overall requirements as an explosive in the field-compounded process.

"Our continuous research program shows that Spencer Prilled Ammonium Nitrate is a superior product," the West Virginia Coal Company goes on to say. "It is manufactured under quality control conditions which guarantee a uniform free-flowing product for superior blast effects."

Spencer offers you free technical advice and service, giving you the full benefits of the knowledge and experience accumulated from its pioneer work in this field. Discover for yourself how much you can save and gain by using this remarkable new blasting process.

Spencer's special bulletin, "Cut Blasting Costs With Spencer Prilled Ammonium Nitrate," and the most expert technical advice in the country are yours for the asking. Mail coupon today!

MAIL THIS COUPON

Spencer Chemical Company
Sales Supervisor,
Industrial Ammonium Nitrate
402 Dwight Building
Kansas City 5, Missouri

☐ Please send me free Spencer bulletin, "Cut Your Blasting Costs with Spencer Prilled Ammonium Nitrate."

☐ Please have a Spencer Technical Service Representative call—without cost or obligation to me.

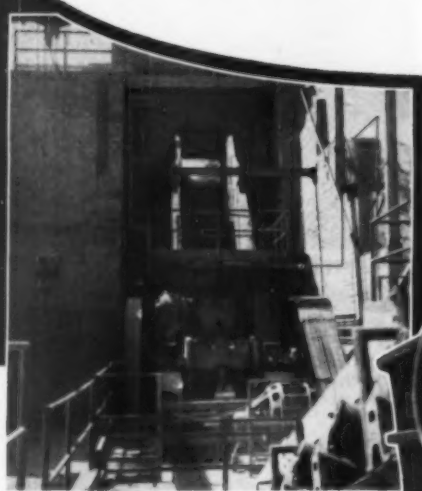
Name_____

Company_____

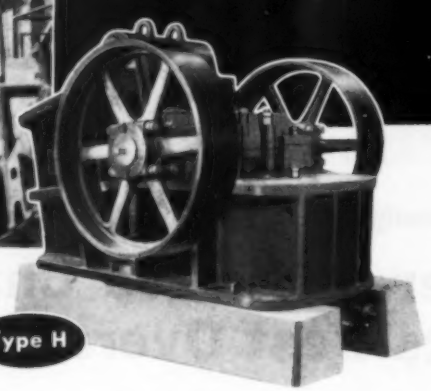
Address_____

Post office_____ State_____

Traylor-MADE
H and HB JAW CRUSHERS

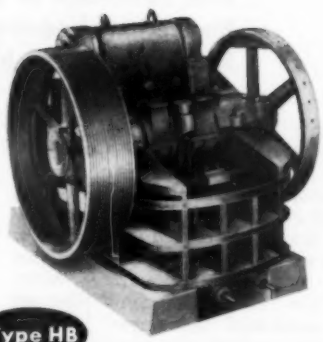


48" x 60" Type HB Jaw Crusher in primary service, reducing quarry material to minus 8".



Type H

The forged steel swing jaw shaft and the patented swing shaft suspension are just two of the features that are built into Traylor Jaw Crushers. Another outstanding feature is the curved jaw plates employing the principal of the famous curved fittings which have proved so successful in Traylor Crushing machinery. For further information on Traylor H & HB Jaw crushers write for Bulletin No. 5105.



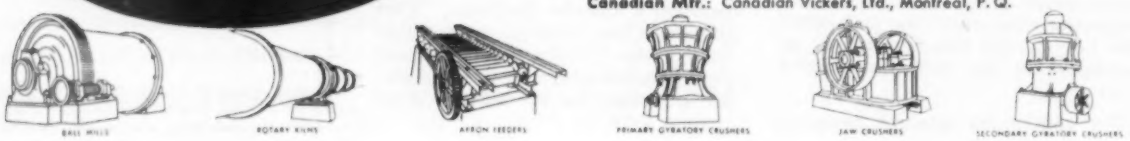
Type HB

Traylor

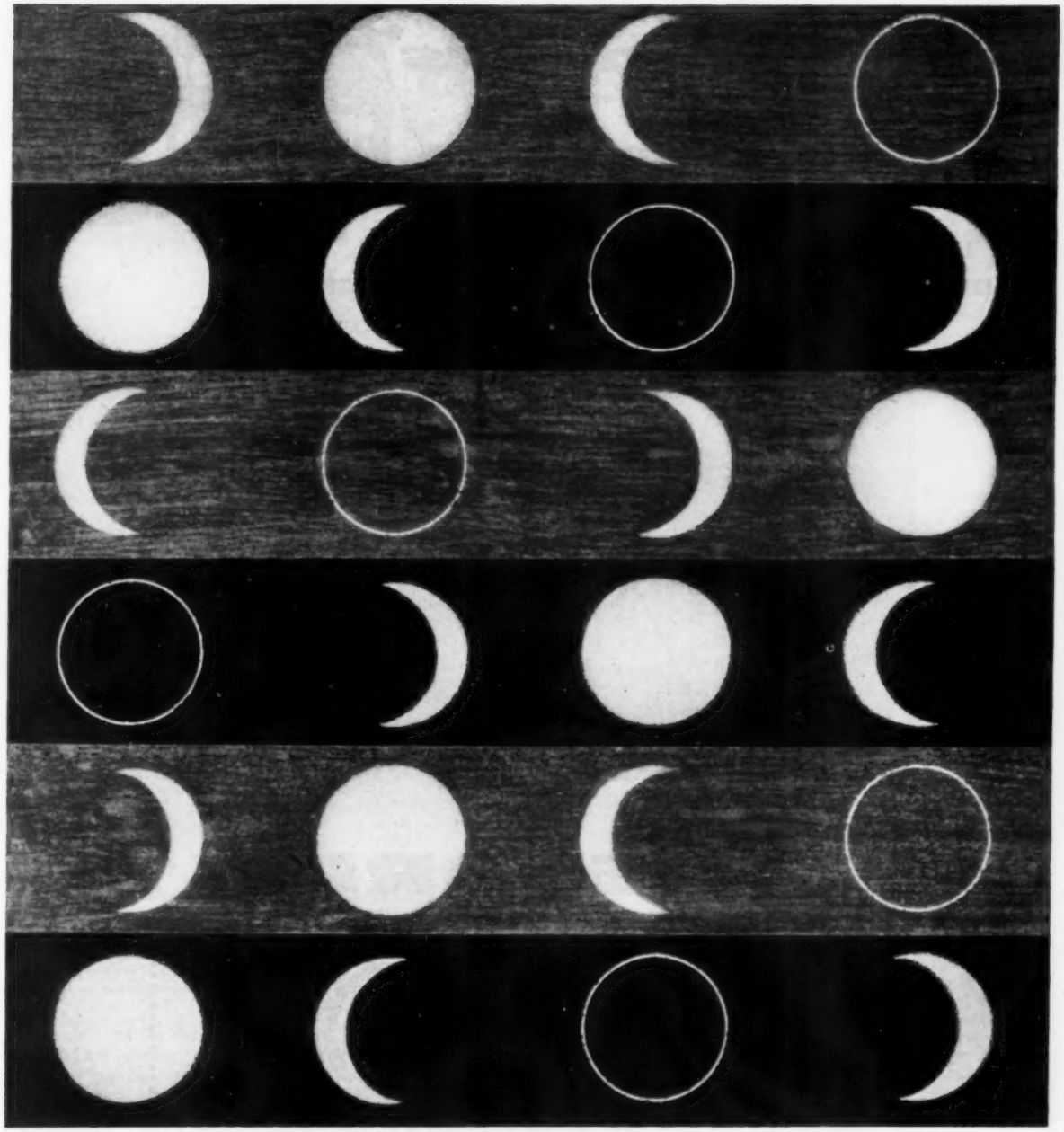
TRAYLOR ENGINEERING & MFG. CO. 1915 MILL ST., ALLENTOWN, PA.

Sales Offices: New York — Chicago — San Francisco

Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P. Q.



BALL MILLS ROTARY KILNS APRON FEEDERS PRIMARY GYRATORY CRUSHERS JAW CRUSHERS SECONDARY GYRATORY CRUSHERS



6 months grinding time...for free

This is the bonus one cement producer got from one set of Ni-Hard ball mill liner segments.*

Unusual? Not at all. Reports from cement plants around the world show Ni-Hard** mill liner segments usually outwear chilled white iron by 100-200% . . . various steels by 50-100%. Often, results are even better.

Ni-Hard mill liner segments are available from authorized producers throughout the country. For a list of them, write Inco.

*Plant name and details on request

**Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street — New York 5, N. Y.

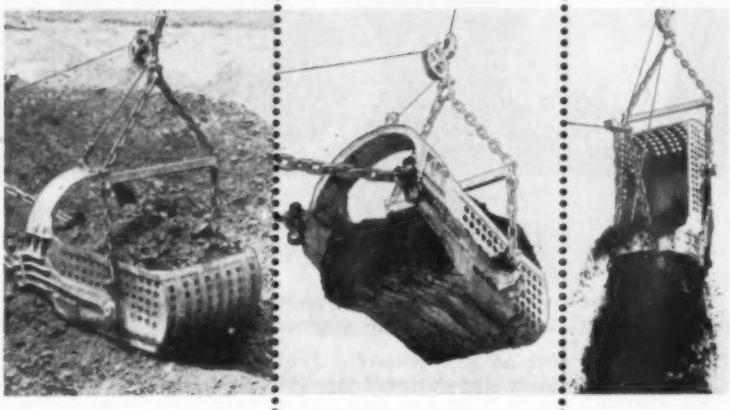
NI-HARD

NICKEL ALLOYS PERFORM BETTER LONGER

moneymakers*

*HENDRIX

DRAGLINE BUCKETS



The combination of Hendrix performance . . . faster loading . . . easier handling . . . and cleaner, smoother dumping add up to increased profits on every operation.

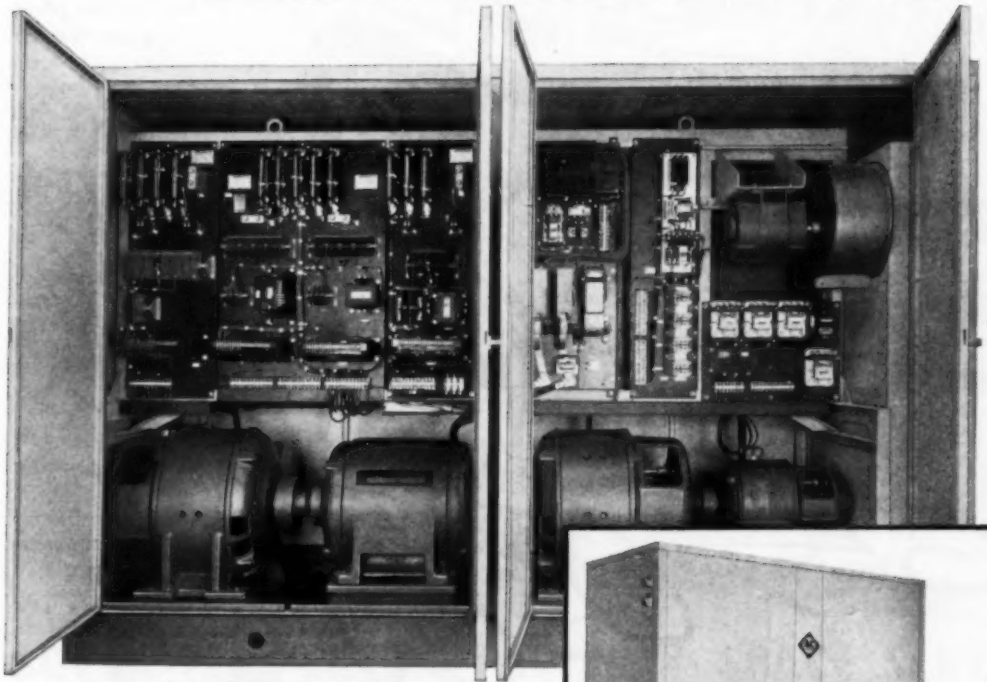
"A Type for Every Digging Purpose"

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA

There's MORE dependable speed control

- high response
- high shock resistance
- no fragile parts
- no maintenance



Adjustable Voltage Multi-Motor Package Drive is ideal for many industrial applications. Self-ventilation keeps unit clean, minimizes maintenance.

Size 3 Adjustable Voltage Power Unit rated 30 hp, of standard construction. Magnetic amplifier excitation provided.

Every one of the design features of the Allis-Chalmers Adjustable Voltage Package Drive assures you an easy, dependable means of power conversion.

Key to Package Drive dependability is the use of a magnetic amplifier to excite the field of the power unit m-g set. Sturdy and simple, this amplifier has no moving parts to wear out . . . no fragile components to be affected by vibrations. AND — there's no wasteful "warm-up" time needed. At the turn of a dial, you get immediate speed control.

Cost-saving assembly

M-g set and control components are assembled in the power unit enclosure at the factory — saving you installation costs. Enclosures used for 30 through 200-hp units are completely collapsible and may be easily disassembled without loss of rigidity. Larger units have separately driven blowers to provide positive ventilation and pressure even when unit is idle.

Available in units from 5 to 200 hp, the package drive is ideal for any application requiring adjustable speed. Contact your nearby Allis-Chalmers sales office or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-5270

CHICAGO
February 10-13, 1958

Show days:
Monday, Tuesday, Wednesday
Thursday morning

at both the Coliseum
and Conrad Hilton

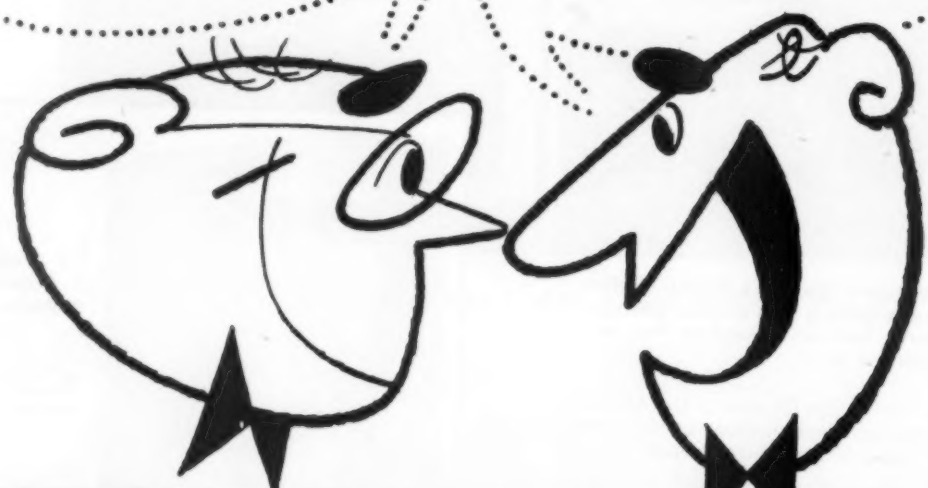
Convention days:
Wednesday, Thursday, Friday

Acres of
Money-Making Ideas

NOTE: 2 full show days free
from convention meetings

Fast, free bus service

DON'T MISS IT!



BIENNIAL SHOW

NSGA
NATIONAL SAND AND GRAVEL ASSOCIATION
42nd ANNUAL CONVENTION

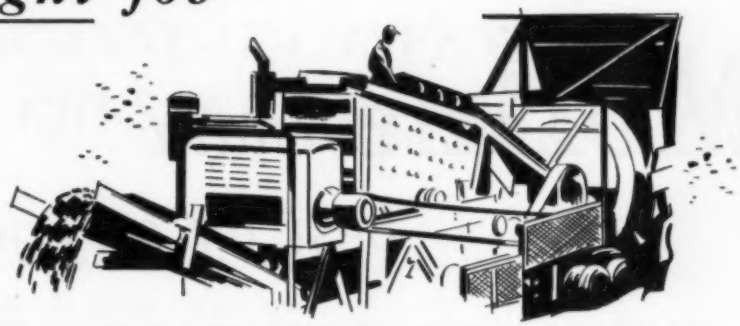
NATIONAL READY MIXED CONCRETE ASSOCIATION
NRMCA
28th ANNUAL CONVENTION

All registrations in lower lobby of the Conrad Hilton, starting Friday, February 7. Registration and Show admission free to producers and users of sand, gravel and ready mixed concrete.

choose the right screen for the right job

Need a screen with low initial cost?

Need a screen that gives long service on average jobs?

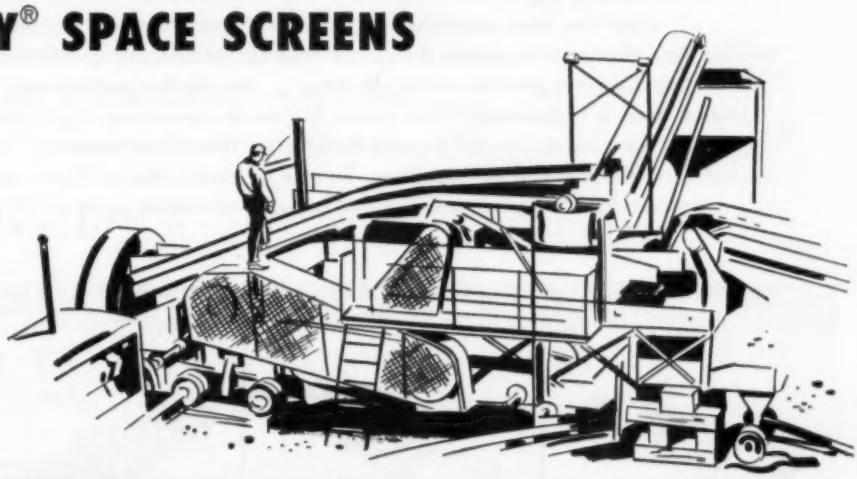


. . . choose

WISSCO-LOY® SPACE SCREENS

Need a screen with high abrasion resistance?

Need lowest cost-per-ton screening?



. . . choose

SUPER-TEMPERED PRECISION SPACE SCREENS

Do you try to match your screening requirements with exactly the right screen—the screen that gives you most for your dollar? Then we suggest that your CF&I representative can help you make that choice. He can offer you *two* top quality space screens—each possessing special advantages, depending upon the type of screening job.

Economically-priced Wissco-Loy Screens, made from alloy steel wire, are designed for jobs where toughness is required, but where abrasive conditions are moderate.

Super-Tempered Screens, made from oil-tempered wire, give long service on jobs where abrasion is expecially severe.

Both these CF&I Space Screens are available in a wide range of standard dimensions, wire sizes, openings and edge preparations—or you can specify any type to meet your own job requirements. For the complete story on Wissco-Loy and Super-Tempered Space Screens, contact your CF&I representative or write direct to Sales and Engineering, 56 Sterling Street, Clinton, Mass.

CF&I **SPACE SCREENS**

THE COLORADO FUEL AND IRON CORPORATION

4460

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso • Ft. Worth Houston • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Antonio San Francisco • Seattle • Spokane • Wichita

WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

CF&I OFFICES IN CANADA: Montreal • Toronto • CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

60 YEARS OF SPECIALIZATION MAKES

Moline *chain*

best by any job test

MOLINE makes just one thing—the world's finest malleable chain. The superiority of this chain has been established by 60 years of specialization. Moline engineers and technicians confine their efforts to improving design and refining manufacturing techniques—to produce chain that will give maximum efficiency . . . trouble-free performance . . . long life. And only Moline chain is triple-tested. That means Moline chains undergo rigid physical testing, visual inspection and gauging by experts. Then, after assembly, they are stressed to proof strength and shock tested for soundness. Be sure to *specify Moline Chain*, malleable or promal, for conveying, elevating and power transmission services. Write today for catalog.

Program Preview

41st ANNUAL CONVENTION
NATIONAL CRUSHED STONE ASSOCIATION

Monday

"Effective Public Relations for Aggregate Producers"

"The Price of the Best Is Always All the Rest"

Presentation of NCSA Safety Contest Awards

Greeting Luncheon—"Laughter vs. Slaughter"

Afternoon—Inspection of Manufacturers Division Exposition

Monday Night Frolic—dancing, dining, entertainment

Tuesday

Operating session—informative talks on operating problems
concurrently with
Round table on taxation, depletion, employee relations

"This Problem of Skid Resistance"

"Telephone Techniques" clinic

Evening open for individual plans

Wednesday

Morning—Inspection of Manufacturers Division Exposition

General Luncheon—"Soviet Union and Eastern Europe"

"Aggregates for Federal-Aid Roads"

"Legislative Outlook"

"Threatened Road Blocks in the Highway Program"

Evening Dinner Dance—entertainment

For the Ladies

Entertainment and special functions for the ever increasing number of ladies attending the convention.

Conrad Hilton, Chicago, Ill. February 17, 18, 19, 1958

A new employee gave us the idea...

Several weeks ago, a young chap being processed by our personnel people—you know, for insurance, hospitalization and so forth—asked whether our company had a Payroll Savings Plan for U. S. Savings Bonds.

This simple question made us realize that while we had a Payroll Savings Plan available we had not promoted it lately among our employees.

We contacted the State Director of the Savings Bonds Division of the U. S. Treasury and discussed this matter. He helped us work out a promotion plan to contact every employee on the Payroll, and thereafter, each new employee we hired. He supplied literature, posters and so forth and helped train the canvassers to do an educational promotion among our employees.

In a short time, with practically no disruption of our business, our campaign was successful. The enthusiastic response floored us. This proved to us employees *want* to save part of their pay and they welcome the convenient Payroll Savings Plan for buying U. S. Savings Bonds.

Your State Director, Savings Bond Division, U. S. Treasury Department, will be glad to help you install The Payroll Savings Plan, or build participation in an existing plan. Write: Savings Bonds Division, U. S. Treasury Department, Washington 25, D. C.

The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

PIT & QUARRY PUBLICATIONS, INC.

Advertising rate per issue:

$10.50 per column inch. Lower rates for larger space used and/or on a contract basis.

Write for rate card.

Closing date:

20th of month preceding date of publication.

PIT & QUARRY

431 S. Dearborn St. Chicago 5, Ill.

BROADCAST

Section

CEMENT PLANT SUPERINTENDENT

REQUIRED FOR ONTARIO PLANT

Must have experience in all phases of cement manufacturing. State experience and qualifications in full. Salary open. No age limit.

Box PQ-302-N, c/o PIT & QUARRY PUBLICATIONS

431 S. Dearborn St. Chicago 5, Ill.

AGGREGATE PLANT DESIGNERS & LAYOUT MEN OPPORTUNITY PLUS SECURITY

Here is an opportunity for qualified men to get in on the ground floor. As one of the world's leading manufacturers and designers of materials handling equipment, we are expanding our operations and need qualified men.

If your background qualifies you, send your resume to,

HEWITT ROBINS INC.

666 GLENBROOK ROAD
STAMFORD, CONNECTICUT

SALES ENGINEER WANTED

Must be experienced in crushing and grinding operations. Midwest location. Old, established, progressive manufacturer. Give full details. All replies confidential. Members of our organization know of this ad.

Box No. PQ-304-K c/o Pit and Quarry Publications

431 S. Dearborn St. Chicago 5, Ill.

WANTED MECHANICAL ENGINEERS and DESIGNERS.

Experienced in engineering, design, construction and operation of aggregate, cement, gypsum and lime plants. Must be familiar with plant layout, conveyor sizing, equipment selection, combustion, etc. Attractive positions with long established, progressive consulting engineering firm in Midwest. Send applications with complete resume, giving age, education, experience and salary requirements to:

PQ-309-N c/o PIT & QUARRY PUBLICATIONS

431 S. Dearborn St. Chicago 5, Ill.

FOR RENT

AVAILABLE FOR RENT OR LONG TERM LEASE

Bucyrus-Erie Model 22-B Cranes, Draglines and Backhoes

Bucyrus-Erie Model 51-B Lifting Crane

BRANDEIS MACHINERY & SUPPLY CO.

Evansville, Ind.
P. O. Box 27
HArrison 3-4491

Louisville, Ky.
P.O. Box 1705
MElrose 7-4741

EQUIPMENT MAINTENANCE SUPERINTENDENT

A challenging opprotunity is open to the properly qualified man with one of the largest highway and heavy-duty off-highway fleets in the country. The man we are looking for should be prepared to take complete charge of a large repair and preventive maintenance shop and handle all labor and vendor relations connected thereto. Salary is open and will be geared to experience and performance. Write, giving job and personal history particulars.

PQ-310-N c/o Pit & Quarry Publications

431 S. Dearborn St. Chicago 5, Ill.

Assayers
Consultants
Designers

Professional Services

Engineers
Geologists
Technicians

CONTRACT DRILLING

Specializing in Quarry Blast Holes using
Ingersoll-Rand Drillmasters

NEW JERSEY DRILLING CO., INC.

Box 431, Madison, N. J. FRontier 7-5996

FOUNDATION TESTING, CHEMICAL ANALYSIS

CORE DRILLING

Thomasville Drilling & Testing Co.

THOMASVILLE, PENNA.

JOHN F. MEISSNER ENGINEERS INC.

CONSULTING & DESIGNING ENGINEERS BULK MATERIALS HANDLING

SPECIALISTS IN DESIGN OF CRUSHED STONE, SAND, GRAVEL AND READY MIX PLANTS

308 W. WASHINGTON • CHICAGO 6, ILL.

CORE DRILLING ANYWHERE

We look into the earth

PENNSYLVANIA DRILLING COMPANY

PITTSBURGH 20, PA.

Quarries
Crushing Plants
Cement Plants
Storage Methods
Operating Costs

E. Lee Heidenreich, Jr.

Consulting Engineer

75 Second St.
Newburgh, N. Y.
Phone: 1828

9 South Clinton St.
Chicago 6, Ill.
Ph. FR 2-4186

Construction
Design
Operation
Plant Layout
Appraisals

JUST PURCHASED

1-F. L. Smidth 8'8" x 176' Unax Rotary Kiln, modern, all welded, new 1943, priced attractively for quick sale

KILNS - COOLERS - DRYERS

2—Vulcan 6' x 50' Rotary Kilns, ¼" shell.
1—Bartlett & Snow 7' x 30' Rotary Dryer, 7/16" shell.
2—Bartlett & Snow 6' x 30' Rotary Dryers, 7/16" shell.
1—Hetherington 5' x 30' Rotary Dryer, ⅜" shell.
1—Ruggles Cole, Class A-8, 5' x 30' Rotary Dryer, ⅜" shell.
3—Louisville 6' x 50' Rotary Steam Tube Dryers.
2—Link Belt 6'4" x 24', 5'2" x 20' Roto-Louvre Dryers.
1—Link Belt 11'6" x 36' Roto-Louvre Dryer.

PULVERIZERS MILLS - CRUSHERS

1—Allis Chalmers 7' x 24' two compartment Compeb Mill 500 HP motor.
1—Patterson 8' x 18' Silex-lined Tube Mill.
1—Abbe Engineering 6' x 15' Silex-lined Tube Mill 75 HP motor.
1—Dixie #3620 Non-Clog Hammer Mill.
1—Williams #2 Slugger Hammer Mill.
1—Allis Chalmers 24" x 12" Jaw Crusher.
3—Jeffrey 20" x 12", 15" x 8" Hammer Mills.

SEPARATORS - SCREENS CONVEYORS - BINS

1—Raymond 16' dia. Single Whizzer Air Separator 50 HP motor.
1—Tyler Hummer 3' x 5' Vibrating Screen.
5—Link Belt, Allis Chalmers 3' x 8' Screens.
7—Rotex, Robinson Gyratory Sifters 40" x 84", 60" x 84", 30" x 104".
9—Belt Bucket Elevators 30' to 60' centers, 8" x 5", 11" x 6" buckets.
950 feet 9", 10", 12", 14" Screw Conveyor with drives.
1—Steel Rectangular Bin 22'8" x 20'6" x 4'10" deep, 13' cone bottom.
1—Steel Rectangular Bin 20' x 20' x 30' high, cone bottom.
2—Steel Cylindrical Bins, 12'6" dia. x 47' high with 9'6" steel skirt.
1—Steel Cylindrical Bin 11'6" dia. x 28' high with Bucket Elevator, and Weigh Scale.

Send for Complete Specifications

WIRE! PHONE! WRITE!

Every Item Priced for Quick Sale

BRILL EQUIPMENT COMPANY
2401 THIRD AVE., NEW YORK 51, N. Y.
TEL: CYPRESS 2-5703

LIQUIDATION

The American Smelting & Refining Co. Mills in the Joplin, Mo. area including all machinery and equipment such as:

Bucket Elevators, Conveyors, Drags, Motors, Compressors, Transformers, Pomona Pumps, Etc.

Write for catalogue

BROWN-STRAUSS CORP.
1546 Guinotte • HA. 1-1000
Kansas City (20) Mo.

MINE & MILL EQUIPT. CORP.
Phone Mayfair 3-8623
Joplin, Mo.

MOTORS • GENERATORS
TRANSFORMERS
NEW • REBUILT
WORLD'S LARGEST INVENTORY
ELECTRIC EQUIPMENT COMPANY
Phone Station Collect GL 3-6783
P.O. Box 51, Rochester, New York

FOR SALE

111 M Marion High Lift Front End with 3½ yard dipper complete with new Crowd Chains and Fawich Clutch; good condition. Located in Southern West Virginia. Phone: Man, West Va., 9229 or New Port Richey, Florida 4212.

BAILEY PRODUCTION CORPORATION

WANTED TO BUY FOR CASH ESTABLISHED QUARRY AND CRUSHED STONE BUSINESS

Reply to:
Box PQ-6133 c/o PIT & QUARRY PUBLICATIONS
431 S. Dearborn St. Chicago 5, Ill.

EQUIPMENT FOR SALE

1—150 Ton Ingram Standard Premixed Concrete Plant.
4 Compartment—3 Aggregate—1 Cement.
550 Bbls. Cement Storage.
150 Tons per hour Aggregate Elevator.
2 Cubic yard Worthington Electric Mixer complete with all Starters, Switches, etc.

Contact RADCLIFF GRAVEL COMPANY
P. O. Box 108, Mobile, Alabama, Phone HE 3-5585

PORTABLE MIXER BARGAIN

6S Worthington, LeRoi Water Cooled Engine, Power Skip, Towing Tongue, mounted on 2 new pneumatic tires. LIKE NEW . . $850.00.

ANDERSON EQUIPMENT COMPANY
P. O. Box 1737 Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

LOCOMOTIVES FOR SALE

Plymouth 10-Ton Model DLC, Std. Gauge, with Climax Model TU Gas Engine.
Plymouth 8-Ton Model DLC, 36" Gauge, with Climax Model TU Gas Engine. (2 units).

CONSTRUCTION & POWER MACHINERY, INC.
270—23d St. Brooklyn 15, N. Y.
SOUTH 8-4900

DEPENDABLE USED MACHINES

Special: Jeep Model No. CJ with Jeep A-Trencher & bulldozer blade.

Shovel front for Lorain 77B	Terratrac 400 w/60" bucket	Telsmith 5x14 dd screen
Bay City 12 ton trailer	Northwest #6 crane & drag	Telsmith 4x10 dd screen
Tandem trailer	Scout backhoe	Telsmith 5x8 dd screen
2 yd. Dumpcrete	Trackson shovel	Pioneer 30x20 conveyor
Austin-Western ½ yd. shovel	TD-9 with B-E bulldozer	Pioneer 18x25 conveyor

This equipment rebuilt in our modern plant by expert mechanics. Come see it!

10004 Southwest Highway TRACTOR & EQUIPMENT CO. Oak Lawn, Ill.

NEW RAIL

20# — 30# — 40#
IN STOCK
LEFTON INDUSTRIAL CORP.
GENERAL OFFICE: 212 Victor St.
St. Louis 4, Mo.

WANTED

2 drum hoist, with or without power, big enough to pull 2, 3, or 4 yd. crescent bucket.

WALKDEN SAND & GRAVEL CO.
522 N. Front St. Niles, Mich.

WANTED

Approx 30 x 18 Roll Crusher
24 or 26" face magnetized head pulley
Ford Tandem Dump Trucks

FOR SALE

#20 Williams Hammermill, Cummins Diesel engine, mounted on heavy rig, with carry-off conveyor. Cheap.

BICHLER BROTHERS, GRAVEL
Phone 1600 • Escanaba, Michigan

FOR SALE EUCLID REAR DUMP TRUCKS

Bucyrus-Erie Draglines, 2½ yd. to 8 yd.
Bucyrus-Erie Shovels, ¾ yd. to 8 yd.
Northwest Draglines, ¾ yd. to 2½ yd.
Northwest Shovels, ¾ yd. to 2½ yd.
Manitowoc Draglines, 2½ yd. to 5 yd.
Manitowoc Shovels, 2½ yd. to 5 yd.
Marion Shovels & Drags, 4 yd. to 9 yd.
Lima Shovels & Drags, 1½ yd. to 6 yd.
Osgood Shovels & Drags, 1½ yd. to 2½ yd.
Caterpillar Graders & Dozers.
Hi-Lift Shovels.
P&H Truck Crane.
2400 Lima Shovel front attachment.
4500 Manitowoc Shovel front attachment.
6" and 9" Drills, Diesel and Electric.

other equipment available not listed above.

WILLIAM LUBRECHT, III
Construction Equipment
311 W. Diamond Ave. - Hazelton, Pa.
Phone: Gladstone 5-4041 or 5-0253

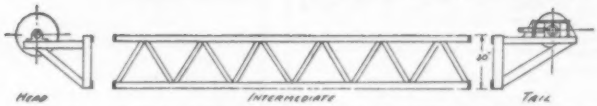
BONDED EQUIPMENT BARGAINS

NEW CURRENT MODELS IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

BONDED®
8" Jr. I Beam Frame Conveyor

BONDED® Truss Frame Conveyors



Complete Pre-Fab sections of 8" Jr. I Beam or Truss Frame Conveyors, quickly and easily joined together on the job. Both types of conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2 1/4" or 2 7/8" diam. shaft. Bonded Truss Frame Conveyors are built like a bridge. Designed for long free spans to 50 feet. Constructed of structural angle and reinforced with steel plate. Special high-tensile bolts are used to join all sections. Prices listed are for I Beam Frame Construction. Prices of Truss Frame Conveyors quoted on request. We take our loss on our stock of short length belting. You can save as much as 50% on the BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28-oz. duck, 1/4" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

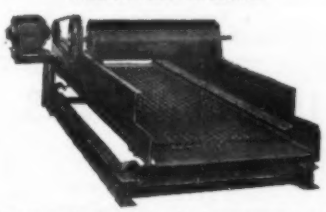
Conveyor Prices Include Belting

Belt Width	Length of Conveyor	List Price	Sale Price	Belt Width	Length of Conveyor	List Price	Sale Price
14"	25'	$1397	$ 722	14"	50'	$2222	$1144
14"	85'	3377	1733	14"	125'	4697	2407
16"	20'	1262	636	16"	45'	2137	1088
16"	60'	2662	1359	16"	90'	3712	1900
18"	25'	1477	794	18"	45'	2217	1166
18"	70'	3142	1648	18"	85'	3697	1933
18"	100'	4252	2220	18"	130'	5362	2797
20"	25'	1517	824	20"	60'	2882	1533
20"	75'	3467	1838	20"	90'	4052	2145
24"	25'	1590	898	24"	45'	2430	1330
24"	70'	3480	1875	24"	100'	4740	2514
24"	120'	5580	2950	24"	150'	6840	3603
30"	50'	2911	1617	30"	70'	3871	2119
30"	90'	4831	2614	30"	140'	7231	3852
36"	25'	1818	1118	36"	45'	2585	1678
36"	60'	3638	2096	36"	100'	5718	3214

For conveyors longer or shorter than those listed above, add or deduct the following per foot prices acording to belt width. Prices include belting.

For 14" belt, add $16.84 per foot;
For 18" belt, add $19.24 per foot;
For 24" belt, add $21.78 per foot;
For 30" belt, add $27.95 per foot.
For 16" belt, add $18.04 per foot;
For 20" belt, add $20.37 per foot;
For 30" belt, and $24.75 per foot;
Write for Bulletins #1138 and #1189.

NEW BONDED® GENERAL DUTY VIBRATING SCREENS



NEW BONDED® HEAVY DUTY VIBRATING SCREENS

For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.

GENERAL DUTY SCREENS, TYPE AS: Eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. Write for Bull. #1086.
Priced from $443.00

HEAVY DUTY MODELS, TYPE BS: Four bearing positive throw eccentric shaft: 3' x 6' to 5' x 14', 1 to 5 decks. Write for Bull. #1087.
Priced from $1160.00

NEW BONDED® FEEDERS

For high tonnage and controlled feed of Aggregate, Sand, Gravel, Crushed Stone, Clay products, Metallic Ores, Coal, Cinders and almost any other bulk material to Crushers, Screens, Conveyors, Mills and other process machinery. Feeder may also be driven from tail shaft of Bonded Troughing Idler Conveyors, thus eliminating the necessity of two motors. All models available in abrasion resistant alloy steel plate. Capacities to 250 tons per hour. Write for Bull. #1140 & #1182.
Priced from $375.00

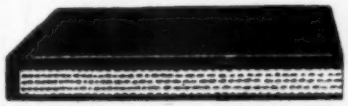
NEW BONDED BUCKET ELEVATORS

Open or Enclosed, Vertical or Inclined Bucket Elevators with continuous or spaced buckets mounted on chain or belting. Recommended for small to medium size lumps, fine abrasive material such as dry sand, coke breeze, wet slag and many other bulk materials. Because of the wide variety of sizes and types, prices will be quoted on request. Write for Bull. #1047.

BONDED CONVEYOR ACCESSORIES

Head & Tail $149.00 | Wing Pulley $71.00 | Guide Idler $14.50

NEW CONVEYOR BELTING SAVE UP TO 30% AND WE PAY THE FREIGHT ON 200 POUNDS OR OVER



12# to 15# Average Friction Pull. 800# to 1000# Average Cover Tensile.

Heavy Duty 4-ply, 28-oz. duck, 1/4" top rubber cover x 1/32" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

Width	Ply	List Price Per Ft.	Sale Price Per Ft.
14"	4	$3.63	$2.83
16"	4	4.08	2.97
18"	4	4.51	3.29
20"	4	4.97	3.80
24"	4	5.85	4.26
30"	4	7.18	5.21
36"	4	8.51	6.18

16# to 19# Average Friction Pull. 2500# to 3000# Average Cover Tensile.

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, 1/8" top rubber cover x 1/32" bottom rubber cover. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

Width	Ply	List Price Per Ft.	Sale Price Per Ft.
14"	4	$4.31	$3.06
16"	4	4.85	3.46
18"	4	5.39	3.83
20"	4	5.90	4.37
24"	4	6.94	4.94
30"	4	8.53	6.07
36"	4	10.09	7.35
24"	5	8.14	5.78

20# to 24# Average Friction Pull. 3500# to 4000# Average Cover Tensile.

A heavier duty 28-oz. duck belt with 1/4" top rubber cover x 1/32" bottom rubber cover. For the higher abrasion resistance applications and handling of materials where more strength is required to give greater belt life.

Width	Ply	List Price Per Ft.	Sale Price Per Ft.
16"	4	$5.48	$3.78
18"	4	6.10	4.20
20"	4	6.68	4.79
24"	4	7.87	5.41
30"	4	9.70	6.65
24"	5	9.11	6.31

Other widths, plies, duck weights and cover thickness available at low prices. Write for Free Sample.

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE

3-roll, 5" diameter Troughing Idlers for:

14" belt	$18.50	24" belt	$21.25
16" belt	19.25	30" belt	22.00
18" belt	20.50	36" belt	22.75
20" belt	20.75	48" belt	25.50

1-roll, 5" diameter Return Idlers for:

14" belt	$7.25	24" belt	$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with easily replaceable prelubricated Sealed ball bearings. Also can be furnished with greasable type Alemite Fitted bearings at slight additional cost. Maintenance is negligible. Bonded Rubber Disc Impact Idlers priced from $61.00. Write For Bulletin #1138.

BONDED SCALE AND MACHINE COMPANY

PHONE Days: Hickory 4-2186 — WRITE FOR FREE CATALOG AND PRICES — PHONE Evenings: AX. 1-2213, HU. 6-3156

110 Bellevue — Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders — COLUMBUS 7, OHIO

QUARRY EQUIPMENT

Cedarapids 2540 jaw only. Rebuilt.
Cedarapids 1836 twin jaw crusher. Good.
Cedarapids 936 jaw crusher.
Cedarapids 3042 double impeller. Rebuilt.
Cedarapids 1624 single pass plant on rubber.
Telsmith 24" single pass plant on rubber.
40" x 12' cone crusher. Good.
12" x 35' inclined open elevator. New.
Cedarapids 4' x 14 double deck screen. Rebuilt.
New Holland 4' x 12' double deck screen. Rebuilt.
Pioneer 4' x 8' double deck screen. Rebuilt.
Smitheo 24" x 87' lattice frame conveyor.
Smitheo 24" x 60' portable belt conveyor.
27½ ton, single-compartment 8' x 12' bin.
60-ton, two-compartment, 8' x 18' storage bin with clam gates.
100-ton, two compartment, 13' x 23' bin.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also conveyor belting.

SHOVELS AND CRANES

Lorain 820 2-yd. diesel shovel-crane.
Lorain 82 2-yard diesel shovel.
Lorain 79-J 1½ yd. diesel dragline.
Lorain 79 1½ yd. diesel shovel.
P&H 655B 1½ yd. diesel dragline.
Bucyrus-Erie 38B, 1⅜-yard diesel dragline. Rebuilt.
Lorain L-50K 1 yd. diesel shovel.
Lorain L-50J 1 yd. diesel clam-crane.
Link Belt LS-85 ¾-yard diesel shovel-drag.
Lima 34 Paymaster ¾-yard diesel shovel. Good.
Unit 1020 ¾-yard diesel powered shovel-crane.
Lorain L-26 ¾-yard diesel powered clamshell.
Lorain L-40 ¾-yard diesel clam-drag shovel.
Lorain TL258 ⅝-yard gas clam-crane.
Unit 614, ½-yard diesel backhoe.
Insley K-12 ½-yd. gas dragline. As is.
Lorain MC-504-W crane clam. Reconditioned.
Lorain MC-414 20-ton Moto-Crane.
Browning T-15-C 17½ ton truck crane.
Link Belt HC-90 25-ton truck crane.

TRACTORS, TRUCKS, SCRAPERS, ETC.

1—Euclid 7-yard overhung engine scraper.
4—Euclid 22-ton rear dumps. Excellent.
1—Mack LRS 15-ton rear dump.
2—Euclid 15-ton rear dumps. Excellent.
5—Euclid 10-ton rear dumps. Excellent.
2—Euclid tractors with 3200 gallon water tank semi-trailer.
1—Pullman S-600, 6 to 8 yard scraper.
1—Caterpillar DW-10 scraper.
1—Caterpillar DW-10 with Athey side dump.
1—Allis Chalmers HD-10 tractor with hydraulic bull-dozer blade.
1—International 300 tractor, with loader, backhoe.
1—International TD-14A tractor with PCU.
1—International TD18 with Bucyrus-Erie bulldozer blade. Excellent condition.
1—Caterpillar D-4 with Eimco front loader.
1—Caterpillar D-7 with cable bulldozer blade.
1—Caterpillar D-8 with cable bulldozer blade.
1—Austin Western diesel powered grader.
1—Adams diesel powered grader.

SHOVEL ATTACHMENTS

Lorain 820, 2-yd., 23' boom, 21' stick.
Lorain 50, 1-yd., 21' boom, 17' stick.
Lorain 40, ¾-yd., 19' boom, 16' stick.
Lorain 30A, ½-yd., 16' boom, 13'4" stick.
Osgood 903, 2-yd., 24' boom, 20'6" stick.

BACKHOE ATTACHMENTS

Lorain 40A, 18' boom, 7' stick, 28", 36" or 44" bucket.
Koehring 304, 19'10" boom, 5'6" stick, 38" bucket.

DIESEL POWER UNITS

Cat. D7700, 74 H.P. at 1000 PFM. Rebuilt.
Cat. D13000, 145 H.P. at 1000 RPM. Rebuilt.
GMC Twin Diesel, rebuilt.
GMC 3021C, 3-cylinder, new.

ASPHALT PLANT

Barber-Greene 848 Model with drier, gradation unit, etc.

AIR COMPRESSORS

105 cu. ft. Ingersoll-Rand gas portable.
125 cu. ft. Jaeger gas portable.
500 cu. ft. Ingersoll-Rand, Waukesha power.
600 cu. ft. Gardner-Denver diesel portable.
420 cu. ft. Gardner-Denver two-stage stationary. Rebuilt.

L. B. SMITH, INC.
Camp Hill, Pa.
Phone Harrisburg REgent 7-3431

FOR SALE

1—Patterson 7 x 18'—Two Compartment Ball—practically new—spare liners, spare gears—400 HP motor and reducer
1—Atlas 5' Dia—22'6 long Ball Mill—stone lining
1—Schmidt 5'6 Dia—21' long Ball Mill—stone lining
1—25B Telsmith Gyratory Crusher
4—F. J. Mack Dumps—rock bodies
1—Used Northwest Shovel—Model 80D—2½ yd.
1—New Northwest Shovel—Model 80D—2½ yd.
1—Generator—156KVA—240 volt 3 phase 60 cycle Murphy diesel—on rubber tires

HARRY T. CAMPBELL SONS' CORP.
Campbell Building • Towson 4, Maryland
Phone - VAlley 3-7000

CONVEYORS: 12", 24", 30", 36", 48" Wide
65, 150 & 200 HP Leffel S.M. Boilers
600 & 300 CFM Air Compressors w/Mtrs.
Stiffleg Derrick with 60 HP Elec. Hoist
332 Al. Ch. Crusher with 25 HP Motor
10x36" Universal Crusher with Hopper
Several Crushers, Ball Mills, Rolls, Elevators, Flotation Equip., Etc.

H & P MACHINERY CO.
6719 Etzel St. Louis 14, Mo.

FOR SALE

2—10x36 Cedarapids Roller Bearing Jaw Crushers, New Bearings and Shafts, first class condition.
2—42"x10 ft. Cedarapids Steel Apron Feeder.
1—25x40 Cedarapids Jaw Crusher—two years old.
1—Model 44 Sanderson "Cyclone" Wire Line Spudder Drill, mounted on Autocar Chassis.

P. O. Box 375, Annville, Penna.

DRAGLINE BUCKETS

2½ Yd. Hendrix Heavy Duty
2½ Yd. Esco—Rebuilt.
Fully Rigged & Priced to Sell.

ANDERSON EQUIPMENT COMPANY
P. O. Box 1737 Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

FOR SALE

DUMP Cars (50) 30 ton, 44" ga. drop bottom.
PLYMOUTH locomotives, 25, 18 ton, std. ga.
CONCRETE batch plants, (4) two with mixers.
EUCLID 15, 22 ton rear dump trucks, (15).
BUCYRUS 120-B, 54-B elec., diesel shovels.
DREDGES, 4 yd. dipper; 16"-20" hydraulic.
BUCYRUS and Page 12 yd., 10 yd., 7 yd. draglines.
LIMA 1201 diesel 3½ yd. shovel-drgl.; 5 others.

H. Y. SMITH CO.
828 N. Broadway Milwaukee 2, Wisc.

EQUIPMENT FOR SALE
TRACTORS — SHOVELS

43 B Bucyrus-Erie, 1¾ yd. Comb. Shovel-Drag
¾ yd. Lorraine Truck Crane
D8 Tractor 2U Series, Bare
2—D8 Tractors with Bulldozers
D7 Tractor w/Hyd Dozer
D7 Tractor w/2 yd. Hilift
99 M Austin-Western 4-wheel drive Grader

SAM BEEMSTERBOER
11732 S. Yale Ave. • Chicago 28, Illinois
PU 5-6000

COMPLETE
SAND & GRAVEL SET-UP

Pioneer-Eagle all electric washing plant, complete with plate feeder with conveyor, delivery conveyors, 4'x12', 3½ deck screen, 3'x6' single deck screen; fine material screw washer; 5", 1000 GPM high pressure pump with 75 HP motor. Comes complete with all piping, fittings, valves and structural supports. Designed to produce 2 types of sand and 3 sizes of coarse aggregate plus oversize. Used less than 30 days—Like new.

PLUS

Caterpillar 955 Traxcavator with 1½ C.Y. bucket. Used only 226 hrs.—Like new.

PLUS

Caterpillar D4 wide-gauge tractor with hyd. 4S dozer and 16" track shoes. Used only 271 hours—Like new.

Today's replacement cost of entire outfit—$70,480.00
OUR SPECIAL SALE PRICE—$48,425.00

ALSO AVAILABLE, with the above. Like new Quick-Way Model 80 Truck Crane mounted on offset cab 6x6 carrier. Used 30 days. Replacement cost—$15,043.00

SALE PRICE, with above equipment—$10,580.00

Write for complete detailed descriptions.

GIBBS-COOK EQUIPMENT CO.
1314 Walnut, P.O. Box 936
Des Moines, Iowa

FOR SALE

2½ Yard Sauerman Slackline Cableway Excavator. 10 inch Dredge with 55 ft., and 120 ft. Swintek Ladders.

DAKOTA SAND & GRAVEL CO.
Box 22, Bismarck, No. Dak.

WANTED

Rotary Kilns and Dryers,
All Sizes, any make.

Box No. PQ-8073, c/o Pit and Quarry Publications
431 S. Dearborn St. Chicago 5, Ill.

LIMA 1201 SHOVELS

New 1951. 3 yd. buckets. Light plants. One had new diesel and tracks this summer f.ob cars Midwest.....$17,500 & $33,000
N. W. 95 DRAGLINE, new 1952, rebuilt....$35,000
Manitowoc 3000-B DRAGLINE.....$45,000
5½ ft. SHORTHEAD & 4 ft. Std. SYMONS.
12-K Gates Allis Chalmers GYRATORY.
4 ft. TRAYLOR TY gyratory, 10" feed.
54 x 24 PIONEER DOUBLE ROLL crusher.
4 x 10 MARCY ROD MILL with 75 hp motor.
44 ton G. E. diesel-electric LOCOMOTIVE.

Construction, Mining & Power Equipment

STANLEY B. TROYER EQUIPMENT CO.
Box 97 Phone 500 Crosby, Minnesota

CYLINDER HEAD REBUILDING SERVICE

CRACKS REPAIRED
MACHINED READY-TO-INSTALL
VALVE GRINDING
PRESSURE AND MAGNETIC TESTING

INTERNATIONAL
CATERPILLAR
G. M. C.
etc.

GAS AND DIESEL

CHAPIN CYLINDER HEAD CO.
9 miles west of Jacksonville in
CHAPIN, ILL. MORGAN COUNTY PHONE 21

FOR SALE

ONE BRAND NEW 16" SUPERIOR McCULLY GYRATORY CRUSHER. NEVER BEEN USED AND ONE SLIGHTLY USED DUE TO CHANGE OF PLANS

DOLESE & SHEPARD CO.
Route 66 and East Ave., Hodgkins, Ill.
Phone: Fleetwood 4-2800 • Ask for MR. DOODY

FOR SALE

1—Penna 15" x 58" Roll Crusher, 350 HP
1—Allis-Chalmers 15" x 30"—"Q" Crusher
1—AA Traylor 42" x 16" Roll Crusher
1—Allis-Chalmers 16" x 48" Roll Crusher
2—Allis-Chalmers 54" x 26" Roll Crusher
1—Allis-Chalmers Sup. McCully Crusher
2—Link-Belt Roto-Louvre Dryers 208-10 310-16
5—4' x 30' Beaird Dryers, Motors & Drvs
2—6' x 45' Louisville Flame Dryers
2—6' x 50' Louisville Rot. Steam Dryers
1—Williams 4 Roll High Side Whiz Sep
1—Raymond 3 Roller High Aide Cone Sep
4—Micro-Pulverizers 1-SH, 2-TH, 3-TH, 3-PF
1—Penna Size D Crusher Hammermill
1—Raymond 6' Double Whizzer Separator
8—Lightnin Model SEV side-enter, 25 HP
1—Lima Model 34 Crane, ¾ yard
1—Bucyrus Erie Model 15 B Crane, ½ yd
2—Insley K 12 Backhoes, ½ yard
1—Bay City 20 ton Truck Crane
1—Joy WL 80 Compressor, 427 CFM, 75 HP
1—Sturtevant 1½ ton Mixer, 75 cu ft Batch
1—Oliver 8' x 18' Cont. Vacuum Precoat
2—Reitz RD-16 Disintegrators, 75 HP Mtrs
1—Komarek-Greaves 15 TPH Briquetting Press
1—Eimco 8' x 8' Ret. Cont. Filter. Comp.
1—Sweetland #2 Filter, 9 bot lvs 4" cent
14—Syntron Spiral Vib. Elevators, 8'6" lift
4—Jeffrey Vib. Conveyors #MC-8", 12' long

MACHINERY AND EQUIPMENT COMPANY
GO WEST
514 Bryant St. • San Francisco 7, Calif.

FOR SALE
Quarry Equipment

1—3648 Kennedy Cuber
1—3 Deck Gyroset screen

CORBISELLO QUARRIES
Box 45, Binghamton, N. Y.

FOR SALE OR RENT—EASY TERMS
Rebuilt — A-1 Condition

48B Bucyrus Erie Shovel, 2 cy Diesel
Northwest Model 6 Shovel, 1½ cy.
Caterpillar D8 Bulldozer

WILLIAMS CONSTRUCTION COMPANY
Box 145, Balto. 20, Md. Murdock 6-6604

POSITION WANTED

Industry executive desires connection with growth potential. Experience includes management positions in sand, gravel, limestone, and ready mix. Presently with multiplant company. Available for interview, National Convention, Chicago, February 10-14.

Box PQ-308-N, c/o PIT & QUARRY
431 S. Dearborn St. Chicago 5, Ill.

FOR SALE

2 Drum American Electric Hoist, American Hoist & Derrick Co., Ser. #1808, Size 26" dia. x 27" inside. Both Chain Driven by 80 HP G.E. Open Induction Motor. Model 0341, Type C55228, 220 Volts, 3 Phase, 60 Cycles, 860 RPM, Ser. #4836600, with G.E. reversing Variable Speed Drum Controlled, CR #32021305A and Resistance Bank Consisting of (2) Banks of (3) Grids each, American Hoist and Derrick, Type I, 60 Cycles, 80 HP, Ser. #420, Entire Unit Mounted on Cast Iron Base, 8'x5'6"x10" thick, Hollow Casting on (3) 10'6" Lengths, 6" I Beam, Complete with Manual Controls. $1800.00

2—1950 Mack Tandem Dump Trucks, Type EQ2D. $2000.00 each
1952 Mack Tandem 10 ton Dump Truck, Type A40S, Serial #8283, Engine #EN377-65-92. $3800.00

Equipment may be inspected at our mine which is located 1½ miles south of Brazil, Indiana on Route 59.

Write, Wire or Phone:
BIG BEND COLLIERIES, INC.
Milton Goodman
332 S. Michigan Avenue
Chicago 4, Illinois HArrison 7-0250

FOR SALE

CEMENT PLANT, 1,200,000 Bbl. yearly capacity with Four Vertical Kilns.
JEFFREY 54" x 30" Hammer Mill, Models 50-B, BUCYRUS Revolving SHOVELS, Models 50-B, 320-B.
ROTARY DRYERS & KILNS: 9x30, 6'x60', 4'6"x 40', 4'6"x32', 4'x30, 3'x15', 3'x24'.
ROTARY COOLERS: 104"x30', 104"x70', Submerged Type.
HARDINGE CONICAL MILL, 10' dia. x 96", with Silica block liners.
PATTERSON BALL TUBE MILL, 5'x22', 200 HP, UNUSED.
AL. CH. 7'x24' COMPEB MILL, 450 HP, two compartment.
AL. CH. 6'x16' BALL TUBE MILL, 30 HP.
SIMPSON #3F Intensive Mixer.
WORTHINGTON Air Compressor, 450 CFM—75 HP.
ROBBINS Vibrating Screen, 3'x10'.
Link Belt BUCKET ELEVATOR, 58' high, 16"x 12"x17" Buckets. Capacity 20 T.P.H.

WE WILL PAY CASH FOR GOOD USED EQUIPMENT

PERRY EQUIPMENT CORP.
1414 N. 6th St. Phila. 22, Pa.
POplar 3-3505

FOR SALE

Mining Equipment
Log Washers - Jigs - Screens, etc.

SCOTT'S WELDING & MACHINE SHOP
Phone 215 Potosi, Mo.

RAILS—All Sections

NEW RELAYING—All Accessories
TRACK EQUIPMENT, FROGS—CROSSINGS TIE PLATES, CONTRACTORS AND MINE & MINING MACHINERY CARS

M.K. Frank
Grand Central Palace, N. Y.
401 Park Bldg., Pittsburgh, Pa.
105 Lake St., Reno, Nevada

WANTED TO BUY

One 2½ Yard AMSCO DIPPER
to fit single stick type
Northwest Model 80-D Shovel
New or Good Used

Reply: Box PQ-304-M c/o Pit and Quarry Publications
431 S. Dearborn St. Chicago 5, Ill.

FOR SALE

1—Unused Fairlead for a Marion Crane, Model 362. Price $500.

IRVING MATERIALS, INC. No. 2
R. R. No. 1 McCordsville 5-2272
FORTVILLE, INDIANA

DRAGLINE

KOEHRING 801, Buda Diesel, 3 Yd. Page Bucket, 80 ft. Boom, Rebuilt & in Good Condition.

Priced to Sell.

ANDERSON EQUIPMENT COMPANY
P. O. Box 1737 Pittsburgh 30, Pa.
Phone: LEhigh 1-4020

FOR SALE or RENT

65 ton Whitcomb diesel elec. loco.
44 ton Whitcomb diesel elec. loco.
25 ton Davenport gas-elec. loco.
50 ton American guy derrick. 115' mast 100' boom
90 HP Lidgerwood 2d diesel hoist w/ swinger
150 HP Amer. #140 3d gas hoist & swinger
1½ yd Lima 602 crane. 110' boom
General Motors diesel engine
110 HP Clayton port. steam generator
5 yd. Bucyrus 120B electric dragline

WHISLER EQUIPMENT CO.
1905 Railway Exchange Bldg., St. Louis 1, Mo.

EQUIPMENT LOCATED

GA. - N. Y. - CALIF. - OHIO - TEXAS - ILL.

AIR COMPRESSORS
3—3078 CFM Inger. Rand 2300 V
5—1372 CFM Gardner Denver 2300 V
3—676 CFM-Inger.-Rand 40T-440 V

DIESEL LOCOMOTIVES
8—Gen. Elec. 25 ton 44 ton 70 ton
3—Whitcomb 65 ton—1-115 ton G.E.
1—Davenport 20 ton Gasoline
1—6 ton 1—8 ton Brookville

175 H.P. 3 DRUM ELEC. HOIST
175 H.P. 3 Drum Hoist, 25 HP. Swinger

STEEL SHEET PILING
1500 ton MZ 32, DP 2, AP 3, 30' & 60'

STEEL DERRICKS
Guy: 3 ton 85 ft. Boom, 25 ton 60 ft. Boom, 15 ton 100' Boom, 29 ton 115' Boom, 50 ton 100' Boom.
Stiff Leg: 5 ton 70 ft. Boom, 15 ton 100 ft. Boom, 25 ton 100 ft. Boom, 75 ton 135 ft. Boom. 1—5 ton 100 ft. Boom.

RAILWAY CARS
177—Dump .Std. Ga. 20, 16, 12, 6 & 4 yd.
36—Flats—10 ton, 40 ton, 50 ton cap.
44—Tank Cars—8,000 & 10,000 Gal. Cap.
75—V Dump Cars, 1½ & 2 Yd.

GRINDING MILLS
Ball Mills—4'6"x9', 6'7"x6', 6'x10', No. 77 and 6'6" x 14'6"
Hardinge Mills—4'6"x16", 5'x22", 7'x48" and 10'x36"
Special—NEW 8'x60" Hardinge Ball Mill
Rod Mills—3'x6', 3'x8', 4'x8', 6'6"x14'6"
Tube Mills—5'x22', 6'x22' and 7'x18'

HAMMER MILLS
Jeffrey—15"x8", 24"x18" and 42"x36"
Pennsylvania 8XT-B-48 THOR, 8XC 13-58 Reversible and 8XT-8
Cedar Rapids 5360H and 3030 Double Impeller Impact Breaker
Williams—GA-60 44"x60" feed opening

APRON FEEDERS
48"x8', 48"x18' and 48"x40' Link Belt

JAW CRUSHERS
Blake Type 40"x42", 36"x48", 30"x42", 30"x36", 12"x24"
Single Shaft 30"x42", 25"x40", 24"x36", 20"x36", 18"x24" and 10"x24"
Cam and Roller 16"x32", 14"x26", 11"x26", 10"x20" and 6"x20"

GYRATORY FINE REDUCTION
Symons 20", 3' and 4' stand. and 2' Shorthead
Kennedy 198, 258 and 378
Sup. McC. 6", 10" and 18"
Traylor 3 and 4' Type TY
Telsmith 488 Gyrasphere and 18" Intercone

GYRATORY PRIMARY
6", 10", 14", 16", 26" and 30" Sup. McC.
3, 4, 5, 6, 7½, 8, 9, 12 Allis-Chalmers Gates Style K
Telsmith 25B

ROTARY DRYERS AND KILNS
Dryers—4'x20', 5'-6"x50', 6'x50', 80"x60'
Kilns 4'8"x46', 6'x28', 6'x65', 8'x125'

WASHERS—CLASSIFIERS
Telsmith 20"x15' Tdwin Screw Sand Classifier and Size 10 Sand Tank
Eagle 20"x15' Single Screw Coarse Material Washer-Dewaterer
McLanahan—10"x30' and 12"x30' Log Washers

DIAMOND PRIMARY PORTABLE CRUSHING PLANT
Model 2A—15"x24" Jaw Crusher, 30"x8' Apron Feeder with Hopper, 24"x26' Delivery Conveyor, gasoline engine on pneumatic tires.

CEDAR RAPIDS SECONDARY PORTABLE CRUSHER
Model 2A, 24"x16" Rolls, 3'x8'—1½ Deck Screen, Roto elevator, 4 conveyors, gasoline engine on pneumatic tires

DIAMOND TANDEM PORTABLE PLANT
Model 66, 10"x36" Jaw Crusher, 30"x20" Rolls, 4'x10' 2½ Deck Screen, Roto Elevator, all conveyors plus hopper with feeder, swivel feed conveyor and Diesel engine

30" RUBBER CONVEYOR BELTING
590'—6 Ply ⅜" TC x ⅛" BC
295'—5 Ply ⅛" TC x ⅛" BC

VIBRATING SCREENS
3 Seco 4x8 DD-2-4x14x3D

IDLE PARTS BOUGHT

R. C. STANHOPE, INC.
60 E. 42nd St., New York 17, N. Y.
Tel: MU 2-3076

FOR SALE

Sturtevant 20x14 Balanced Rolls
Sturtevant 12x12 Balanced Rolls
Sturtevant #1 Ring Roll Mill
Sturtevant #2 Ring Roll Mill

J. H. PERKOSKI Investment Building
Pittsburgh 22, Penna.

FOR SALE OR RENT

LOCOMOTIVE

1—45-ton Whitcomb Diesel Electric Locomotive. Reconditioned by Baltimore & Ohio Railroad.

POWER UNIT

1—D-8800 Caterpillar diesel, 4-cyl., 98-HP, with starting engine, clutch, outboard bearing.

SPECIAL

3—AMERICAN HOIST & DERRICK COMPANY double-drum Dragscraper Hoists, 5000# line pull @600 FPM on rear drum 12,000# line pull @250 FPM on front drum. Silent chain drive. Two equipped with 125 HP electric motors. One equipped with 150 HP Hercules diesel engine. Will sell with or without power for fraction of new price.

EXCELLENT CONDITION

Write for Stock List No. 456

ECA
EQUIPMENT CORPORATION OF AMERICA

CLIFTON HEIGHTS, PA., Box P-608, Sub. of Phila.
GROVETON, PA., Box 43P, Sub. of Pittsb.
CHICAGO 4, ILL., 327P, So. La Salle St.
NEW YORK 7, N. Y., 30-P Church St.

FOR SALE

4' x 10' Tyrock F600 Screen
I.R. Tugger Hoists (Air)
Syntron F33 Feeder
Syntron V200 Vibrators
Syntron V125 Vibrators
Rotary Feeders, 1 to 3 Cu. Ft.
Vari-Speed Drives 1 to 3 H.P.
105 Ton Blaw Knox with 2 Yard Batcher
590' x 30" 6 ply Belt, 90% New
Elev. Chain C102B-111-102½
Jacketed Screw Conveyor 12"
8" x 27' Enclosed Elevator
8" x 29' Enclosed Elevator
8" x 31' Enclosed Elevator
8" x 38' Enclosed Elevator
10"x 38' Enclosed Elevator
14"x 33' Enclosed Elevator
14"x 39' Enclosed Elevator
6" x 24' Perf. Disch.Encl.Elev.
16"x 30' Perf. Disch.Encl.Elev.
4' x 40' Dryer, Spare Parts
Two 10' Dia. x 28' High Tanks
Stiffleg Derrick 15 Ton—110' Boom
Worthington Wagon Drill WP251
Two Type 38 4 x 10' Hummers
Seco Screen 4' x 14' triple deck
Seco Screen 4' x 8' double deck
Deister 3 Deck 5' x 10' Screen
Farrel 36" x 10" Blacke Crusher
Farrel 24" x 13" Blake Crusher
Williams Hammermills 50 to 100 H.P.
Cedar Rapids 9" x 12" Jaw Crusher
Climax 10" x 20" Jaw Crusher
Acme 9" x 16" Jaw Crusher
Jeffrey 24" x 18" Pulverizer
Sturtevant #1 Rotary Crusher
Kennedy #19 Secondary Crusher
Diamond Portable Crushing Plant, 15 x 24, Pneumatics.
Cedar Rapids 25 Yd. Secondary Portable Crushing Plant.

G. A. UNVERZAGT & SONS INC.
136 Colt Street — Irvington, N. J.
Essex 3-8105

Save on Your INDUSTRIAL TRACK

FOSTER QUALITY — FULLY GUARANTEED

RELAYING RAILS

Handle more cars better—cost less to install and maintain. Foster stocks all Rail Sections 12# thru 175#, Switch Material and Track Accessories.

SEND FOR CATALOGS

RAILS - TRACK EQUIPMENT - PIPE - PILING

L B FOSTER CO.

PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

FOR SALE

WHITE L-12 ASPHALT PLANT, COMPLETE EXCEPT TANKS. REPAIRED, READY FOR OPERATION. MUST BE SOLD AT ONCE.

WYANDOT BLACKTOP CO., Inc.
MARION, OHIO — Phone - 28544

MOTORS AND GENERATORS

All sizes, new and rebuilt. Starters, accessories, pulleys and repair parts. Gear motors. Falk Shaft mounted Speed Reducers, couplings and V-belt drives.

EXPERT REPAIR SERVICE

NUSSBAUM ELECTRIC CO.
220 E. Douglas Avenue — Fort Wayne, Ind.

FOR SALE

1¼ yd. Manitowoc for parts Serial #168, also 8800 Cat power unit.

WALKDEN SAND & GRAVEL CO.
522 N. Front St. — Niles, Mich.

LORAIN

L820 Shovel Attachment

In Excellent Condition
Complete (No Lagging)

$4,500

EDWARD EHRBAR, INC.
100 Secor Lane
Pelham Manor, N. Y.

FOR SALE

1—Williams 4-roll Mill (Gnome Size), Complete.
1—Raymond 3-roll High Side Mill, Complete.
1—Bartlett & Snow Rotary Dryer, Size 54" x 36' x 6' with Roller Trunnions, 10 HP Explosion-proof motor and Reeves Varispeed Drive.
2—Louisville Rotary Dryers, 6' x 45'.
2—Columbia Engineers Rotary Dryers, 6'4" x 45'.

R. GELB & SONS, INC.
U. S. Highway 22, Rahway Valley R. R.
UNION, N. J. — MURDOCK 6-4900

SHOVELS – DRAGS CRANES – DRILLS EUCLIDS

7400 Marion Dragline, 160', 13 yd.
625 Page Diesel Drag, 150', 10 yd.
621-S Page Diesel Drag, 125', 6 yd.
2400 Lima Drag, 120', 6 yd.
4500 Manitowoc Drag, 120', 5 yd.
5-W Bucyrus Erie Drag, 120', 5 yd.
111-M Marion Drag, 100', 4 yd.
1201 Lima Drag, 85', 3 yd.
54-B Bucyrus Erie Drag, 120', 5 yd.
2400 Lima 5½ yd. H. L. Shovel
120-B Bucyrus Erie 4 yd. Elec. Shovel
1201 Lima 3½ yd. Standard Shovel
3500 Manitowoc 2 yd. H. L. Shovel
Unit 1020 ¾ yard Shovel
Also, various smaller Shovels & Drags
600 Reich Heavy Truck Mounted Rotary Air Drills
McCarthy Coal Recovery Auger Drill
Euclid Trucks—Rear & Bottom Dump
Caterpillar & International Dozers
Garwood, Allis-Chalmers & Euclid Scrapers
Front End Loaders

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Natl. Bank Bldg. Hazleton, Pa.
GLadstone 5-3658

CATERPILLAR D7

With Angleblade & Double Drum PCU, in good running condition.

Reasonably Priced

ANDERSON EQUIPMENT COMPANY
P. O. Box 1737 — Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

FOR SALE BY OWNER

1 Motor, electric 40/20/27 H.P. Allis Chalmers, three speed, 1740/870/1150 R.P.M. open type, 3 phase, 60 cycle, 440 volt.
1 Motor, electric, 10 H.P., G.E. 1160 R.P.M., 220 Volt, 3 phase, 60 cycle, double extended shaft.
1 Motor, electric, 40 H.P. Allis Chalmers, 865 R.P.M., 3 phase, 60 cycle, 440 volt, slip ring open type.
1 Bucket, 1¾ yard capacity for Lull Shovel Loader.
1 Screen 3'x10' single deck, Allis Chalmers low head.

for further information contact J. H. CLEMENTS

BASIC INCORPORATED
MAPLE GROVE, OHIO
POST OFFICE, FOSTORIA, OHIO

CRANES & SHOVELS

Bantam	"M-49"	⅝ yd. Trench Hoe, mounted GMC 6x6.
Sargent	"410"	New ⅜ yd. Hoe or Crane, mounted on new Crane Carrier. Substantial discount.
Insley	"K-12"	½ yd. Trench Hoe, Crane or Dragline, (2).
Marion	"331"	⅜ yd. shovel or Dragline.
Byers	"83"	Used ⅜ yd. Crane/Dragline.

LOADERS

Caterpillar	"D-4"	Diesel Tractor w/Trackson Tractor Shovel. Rebuilt tracks and engine.
International	"TD-9"	Used Diesel Tractor w/Bucyrus-Erie Hydr. Tractor-Dozer.
Pettibone	"10"	Used 1 yd. Tractor Shovel, 4-wheel drive.
Barber-Greene	"545-46-3"	Used Rubber-Tired Bucket Loader.
Haiss	"75C"	Used Crawler Bucket Loader @ $2000.

MISCELLANEOUS

Gruendler	"1024"	Roller Bearing Jaw Crusher.
Pettibone-Wood	"820A"	New Windrow Proportioner. Reduced for quick sale.
Pettibone-Wood	"P620"	Used Preparizer, G-M Power, Diesel. Will rent or sell.
Jaeger	3 Yd.	(4¼ yd. Agitator) Hi-Discharge Mixer, un-mounted, sandblasted, cleaned, painted.
*Jaeger	4½ Yd.	Hi-Discharge Transit Mixer, mounted 1953 GMC "450" Tandem Truck.

NOTE: This Equipment Located in our Yard except as marked*

EIGHMY EQUIPMENT COMPANY, ROCKFORD, ILLINOIS
120 S. Pierpont — Phone 4-6706

FOR SALE

2—7 ton Greensburg Electric Locomotives with 4 storage batteries, boxes, with charger. Ser. #2308-09. 36" gauge, 48 cell battery, 19 plates. Exide type TLM.
Price for lot.....$8500.00

1—Model 200-D Rex 8" Double Pumpcrete Machine, electric driven, with Pug Mill and mounted on 36" gauge car wheels. Ser. #CPD-234, with approx. 450' of pipe and fittings.
Price for lot.....$4500.00

1—Model 40 Eimco H.D. Rocker Shovel with belt attachment (no belt) and double tired wheels for 36" gauge track. Ser. #40306. Some parts included.
Price $9000.00

FOR SALE OR RENT

1—I.R. Low Air Compressor, Cap. 4780 CFM, with Starter, 3 phase, 60 cycle, 2300 volts. Air Locks, Air Drills and Steels, Buckets, Pumps and Shaft Hoists.
36" Gauge Flat and Dump Cars.
Muckers—#40 Eimco and Conways.

MAHONEY-CLARKE, INC.
217 Pearl Street — New York 38, N. Y.

FOR SALE

1—Type AF-312 Sullivan 3-Drum Slusher Hoist, 3170# Rope Pull, 208 FPM; 20 HP, 3/60/220/440.
1—30" Pacific Slushmaster Scraper.

MACHINERY RESERVE OF DENVER
4150 Fox St. — Denver 16, Colo.
Phone: GL 5-9419

FOR SALE

SEPARATOR—Dings Magnetic with 3 cross belts. Complete with rectifiers and electromagnets. 220 volt.

PUG MILL—Chambers 30" x 14'7" with Drive.

PAN CONVEYORS—24" x 18'—30" x 33'—36" x 54'.

ELECTRIC MOTOR—200 HP, 875 RPM, GE Slip Ring. Serial 4405764, 440/3/60. $1500.00.

G. & W. H. CORSON, INC.
Plymouth Meeting, Pa.

Marion Type 93-M Shovel, Serial No. 21514 powered with CAT D337F Diesel Engine with Twin Disc torque converter. Shipped new in May, 1956. Price $65,000.00.

For further information contact:

MR. A. E. BURGESS
3700 10th Avenue North
Birmingham, Ala.

FOR SALE

1—9W Bucyrus-Erie Dragline
4—200W Bucyrus-Erie Draglines
1—620 Page Dragline
1—1201 Lima Dragline
1—80D Northwest Shov. & Drag. Comb.
1—120B Dragline Boom
1—Koehring 1½ Yd. Elec. Tunnel Shov.
1—44B B-E Comb. Drag. & Shovel
6—9LTD Euclids Bottom Dump
4—36TD Euclids End Dump

Catalog on request.

J. A. TERTELING & SONS, INC.
Box 1428 • Ph.: 3-5401
Boise, Idaho

When you need...

LOW COST—DEPENDABLE INDUSTRIAL RUBBER PRODUCTS

call CARLYLE

FOR ALL YOUR REQUIREMENTS OF

RUBBER HOSE

Air	Discharge	Suction
Acid	Fire	Water
Paint Spray	Fuel Oil	Steam
Solvent	Oil Suction	Vacuum
Welding	& Discharge	Pneumatic
Pile Driver	Gasoline	Road Builders

BELTING

Conveyor	Grader	Hot Material	V-Belts
Elevator	Chute Lining	Mucker	Transmission

PROMPT SHIPMENTS LOW COST QUALITY PRODUCTS

CARLYLE RUBBER CO., INC.
103-107 Warren St., New York 7, N. Y. Digby9-3810

KOEHRING DUMPTORS

Two Koehring Dumptors, 16.00x24 and 10.00x20 tires. GMC 4-71 Diesel Engines. Good condition.

$6,500.00 (each)
F.O.B. Evansville, Ind.

BRANDEIS MACHINERY & SUPPLY CORP.
U.S. Highway 41 — HArrison 3-4491
N. at Diamond Ave. — Evansville, Ind.

FOR SALE

1-General Motors Diesel Electric Generating Set, Series 6-110 Diesel Engine, latest type with electric starting. Direct connected to 100KW, .8 P.F. 220/440 volt, 3 phase, 60 cycle, 1200 RPM. Delco generator with 110/220 volt, single phase take-off. Complete with control panel and all automatic shut-down safety devices. Excellent condition, 2 years old, used 3000 hours.

REYNOLDS & SON, INC.
84 NORTH MAIN ST. — BARRE, VERMONT

FOR SALE

25 x 40 Austin-Western Jaw Crusher, S/N 254046, roller bearing, crown face flywheels, completely reworked.

42" x 12' lg. Telsmith Apron Feeder S/N 4842, with 7½ H. P. speedreducer and chain drive. Reconditioned and in A-1 shape. (No hopper or sideboards).

POWER EQUIPMENT COMPANY
Crusher & Conveyor Div.
Knoxville 15, Tennessee
Pho. 3-1121

FOR SALE

Crushing and Milling Equipment Located in New Jersey

Gyratory Crushers
Allis Chalmers 8-K, spare parts, extra shaft.

Smooth Roll Crushers . . .
1—Traylor, 54" x 24", type "AA" (2 motors)
2—Superiors, 16" x 36" (2 motors)
2—Traylors 16" x 30" type A

Mills . . .
Marcy Rod Mill, 3' x 6' with spare parts
Traylor Ball Mill 7' x 6' with 250 HP motor (several tons of balls available)

Trough Belt Conveyors . . .
All have 20" Rex Roller Bearing Idlers
1—14" x 166' has 35 troughing Idlers
1—14" x 36' has 7 troughing Idlers
4—18" x 20' has 3 troughing Idlers
1—18" x 40' has 11 troughing Idlers
1—20" x 29' has 7 troughing Idlers
1—20" x 36' has 7 troughing Idlers
1—36" x 21' has 6 troughing Idlers

Loading Bins . .
6 bins, 16' diameter x 14½' height. Cone tops and flat bottoms. Mounted on 10" H-beams with 15' clearance under bins.

Cone Tank . . .
1—16' diameter with 60° slope.

Vibrating Screens . . .
7—Selectro 4' x 10' Single deck
5—Tyler Hummer 4' x 10' Single deck
8—Tyrock 4' x 10' Single deck

Track Scale . . .
1—Fairbanks Single Beam track scale 200,000# capacity

Pillow Blocks . . .
75—Dodge Timkin Roller Bearing 7⅞" bore
80—Dodge Timkin Roller Bearing 1⅞" bore

Dust Collector . . .
Schnauble Multi-Wash Collector type H-B-6P

Compressor . . .
Chicago Pneumatic 17" x 16" x 12" rated 788 CFM at 125#

Hoists . . .
1—Vulcan Mine Hoist, 42" x 60" drum
1—Exeter double drum hoist, 23" x 24" drums

Positive Pressure Blowers . . .
1—Wilbraham Green, Size 19.55 x 24
2—Roots Connersville, Size 3

Motors . . .
Over two hundred motors, Slip ring, gear head, etc. Many sizes and speeds.

Available for inspection at plant site in New Jersey

L. J. Land, Inc.
P. O. Box 756 — Reading, Pa. — Franklin 44953

FOR SALE

**KILNS—
COOLERS—DRYERS**

8'6"x50' Allis Chalmers Rotary Kiln
8'x150' Vulcan Rotary Kiln
6'x50'x7/16" Allis Chalmers Rotary Dryer
4'x30' Ruggles Coles Rotary Class XH2

**PULVERIZERS—MILLS
CRUSHERS**

Jeffrey 30"x30" 2-roll Crusher
Jeffrey 24"x30" 2-roll Crusher
Raymond 5-roll Low Side
Raymond 4 Roll High Side
3620 Dixie Non Clog Hammermill
20"x12" Jeffrey Style A, NEW
15"x8" Jeffrey Style B, NEW

**PARTIAL LISTING ONLY
SEND US YOUR INQUIRIES**

OTHER ITEMS

78"x36" Akins Duplex Spiral Classifier
4'x8' Symons Vibrating Screen
4'x6' Syntron Vibrating Screen

HEAT & POWER Co., Inc.

ROCK PRODUCTS EQUIPMENT DIV.

40 EAST 42nd ST.
NEW YORK 17, N. Y.
MUrray Hill 7-5280

310 THOMPSON BLDG.
TULSA 3, OKLAHOMA
Diamond 3-4890

LOCOMOTIVES: 4—Electro Motive Service diesel electric freight type, 1500 H.P., 120 tons, of the operating type, and two non-operating or booster type, same as above. One 98 ton diesel electric Switcher, 900 H.P. Two Electro Motive Service 600 H.P. Switchers. Two 50 ton diesel electric Switchers with Cummins diesel motors and G.E. electrics. One 35 ton and one 25 ton diesel electric. One 20 ton diesel. One 16 ton gasoline.

DRYERS & KILNS: Two 8 ft. x 125 ft. Kiln. One 5 ft. x 50 ft. Kiln. One 4 ft. x 35 ft. Dryer. One Link Belt 5 ft. x 20 ft. Roto Louvre. One 6 ft. x 24 ft.

COMPRESSORS: Ingersoll Rand PRE-2, 780 H.P., 4500 CFM, 2200 vo'ts. Ingersoll Rand PRE-2, 500 H.P., 2500 CFM, 2200 volts. Chicago Pneumatic OCE, 300 H.P., 1500 CFM, 2200 volts. Joy WN-14 Radial model F, 300 H.P., 1825 CFM, 2300 volts.

OVERHEAD ELECTRIC TRAVELING CRANES: 230 volt, D.C., cage control, 7½, 10, 20, 25, 35, and 50 tons, in span lengths 34'6", 37', 47'3", 56', 62', 66', 74' and 79'. One 7 ton capacity, 4 motor, bucket operating, 75 ft. span.

MINE HOISTS: One 7' x 7' single drum, 400 H.P., 1⅛" rope. One 10' dia., 7' face, single drum with center dividing flange, 400 H.P., 1¼" rope. One 5' dia., 5' face, single drum with center dividing flange, 100 H.P., 1" rope. One 84" dia., 54" face, double drum, 1⅜" rope, 400 H.P. One 10' dia., 10' face, double clutched drums, 1250 H.P., 1¾" rope. All the above hoists have post brakes, Lilly control, 2200 volt and all are complete.

CLAM SHELL BUCKET: Williams 1¼ yd. capacity, excellent condition.

JAW CRUSHERS: 10 x 15, 10 x 20, 12 x 24, 15 x 36, 24 x 36, 25 x 40, 30 x 42 and 40 x 42. One 18 x 30" sectionalized for underground use.

**WE BUY AND SELL EQUIPMENT
THROUGHOUT
NORTH AND CENTRAL AMERICA**

A. J. O'NEILL

Lansdowne Theatre Building
Lansdowne, Pa.
Phila. Phones: MAdison 3-8300—3-8301

TRANSFORMERS

3—1000 KVA Penn. 33000-2500-4330Y
3— 500 KVA W-H 33000-2400/4160Y
3— 500 KVA W-H 13200-2300/3985Y
9—333 KVA Bol. 33000-7200
3—333 KVA W-H 13800-240/480
3—333 KVA Mol. 2300/4000Y-230x460

Send For Complete Information TODAY!

Transformers Bought, Sold, Repaired and Rented
45 Years of Dependable Service

The Electric Service Co.

5319 Hetzel Street • Cincinnati 27, Ohio

ROCK WAGONS

Two C & D Movall Model RD-1520, 16 C.Y., cable operated, forced ejection rock wagon with sheave rock guards and cable savers. Complete for use with Caterpillar DW15 Tractors. Used only on one short job—in excellent condition.

GIBBS-COOK EQUIPMENT CO.
1314 Walnut, P.O. Box 936 • Des Moines, Iowa

LEROI TRACTAIR COMPRESSOR

Self Propelled, 105 cu. ft. Machine. Good Rubber, ready to go. Specially Priced at $1,350.00

ANDERSON EQUIPMENT COMPANY
P. O. Box 1737 Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

FOR SALE

Brand new sand and gravel plant located only 35 miles from the largest market in Texas. Plant will produce 1,000 cubic yards per nine hour working day. There is a ready sale for all the material the plant can produce. If interested, don't delay as this is a real bargain and will be sold quick.

After six call Turner 5-2251
or write:

Brazos Valley Sand & Gravel Co.
P.O. Box 154, Sealy, Texas

MICHIGAN 175A Tractor Shovel, 2½ cy., #17857, new 1956, used 600 hrs. Like new. $16,000 Rental Purchase.
LIMA 1201 Shovel, Cummins diesel, 3 cy. dipper, new 1951. $19,750.
GARWOOD 70 Shovel, ¾ cy. Bargain. $2000 Yard.
PIONEER 2036 Jaw Crusher Portable Primary Plant w/apron feeder, under-conveyor, Cat. diesel, tandem rubber. $14,000 Rental Purchase.
DIAMOND 24x36 Jaw Crusher Portable Primary w/feeder, vibr. grizzly, conveyor, diesel power, tandem rubber. $17,500 Rental Purchase. Texas. Also Secondary Portable available w/40x20 rb. Double Roll, 4x12 screen, rotovator, diesel power, tandem rubber. $15,000 Rental Purchase. Texas.
CEDARAPIDS Commander Plant w/1036 jaw, 3022 rolls, 4x10 screen, rotovator, tandem rubber. $28,500 Rental Purchase. Texas.
CEDARAPIDS 22x36 rb. Jaw Crusher. $6500.
CEDARAPIDS 25x40 rb. Jaw Crusher. $9000.
PIONEER 9x36 pb. Jaw Crusher, excellent. $900 Yard.
AUSTIN WESTERN 4x40 rb. Jaw Crusher. $1350 Yard.
BARBER GREEN 24x30 Portable Conveyor. $1000. Also Pioneer 30x60 Portable. $2750.
CEDARAPIDS 30x22 rb. Double Roll Crusher, excellent. $2250 Yard.
GILSON #28 Hammermill, 30x28, excellent: $1250 Yard.
ROGERS 30x30 Hammermill, good. $1500 Yard.
(2) ALLIS CHALMERS Lo-Head horizontal Screens, 5x10 w/motors. Excellent. $1350 each. Yard.
DEISTER 5x14 3-deck Plat-O-Vibr. Screen, used 2 seasons. $3750 Yard.
SIMPLICITY 4x12 2-deck Screen, mdl. D. $1150 Yard.
SECO 4x10 2-deck Screen. Good. $1000 Yard.
P&H 655 Shovel Buckets, Brand new, complete, cost $3000. Our price $1250 Yard.
P&H 255A Shovel Fronts, Brand new, bargain. $1000 Yard.
DAVEY 210 cfm Super Chief Portable Diesel Compressors, late model, on rubber, rebuilt. $2350 each. Rent $250/mo. apply purchase. Yard.
WAGON DRILLS. Cleveland D14 on rubber $600. Gardner Denver D99DT w/8' or 14' tower & air motors on rubber $950. Ingersor FM2 on rubber $950 C-P mdl. 70 w/air motor on rubber. $950. All rebuilt Yard.

WENZEL MACHY. CO.
565 S. 10th St. Kansas City, Kans. Mayfair 1-1710

GRAVEL PLANT WANTED

Have experience. Know how and desire. Some cash. Want going business small for one man, big enough for good living. Would consider ready mix plant on right terms.

BOX PQ-301-N c/o PIT & QUARRY PUBLICATIONS
431 S. Dearborn St. Chicago 5, Ill.

FOR SALE

SHOVELS & DRAG: Insley K10, Genl 310, 420, Link Belt 60, 75, 85, 360, 595. Lorain 41, 50, 820, Bucyrus GA2, 54B, 88B, 200W, NW5, 6, 7, 80D. P&H 855, 1055. Marion 40A, 43M, 92. Manitowoc 3500, 4500. Byers 83. Lima 44, 1201. Monighan 4W. Koehring 304, 702.
CRUSHING PLANTS: CR2036, 2236, 2436, 2540 & Pitmaster, Jr., Super, Commander, Lippmann 1836, 2436 & 36" Gyr. Univ. 880 AW 81, Pioneer #4, Diamond 65. Others.
CRUSHERS: 1020, 1040, 1224, 1536, 1836, 2036, 2436, 3042, 4042, 4248, 8466 JAW. 37½, 38½, Kennedy, 10, 16", 18", 36", & 50" McCully, 13B, 20B, 28", 36", 48" Telsmith 636 AC GYR. 5424, 4022 DBL ROLL. 2, 3, 4' CONES.
DRYERS: 42"x36, 5x40, 6x30, 8x70, 9x50.
MILLS: 3'x8", 8'x36", 8'x48" Hardinge conical Ball. Kent #7, 2033, 3033, 4033 CR Hammer.
WASHERS: 27x15, 24x18. DREDGES: 6", 8", 10".
CONVEYORS: 24x90, 30x200, 36x151, 42x160.
Repros.: Bonded Scale & Mch. Co.

MID-CONTINENT EQUIPMENT CO., INC.
8321 Gannon St. Louis 24, Mo. Wydown 1-2826

FOR SALE
BOTTOM DUMP EUCLIDS

4—17 Yd. Euclids @ $13,500 Each
11—13 Yd. Euclids @ $ 9,500 Each
1—¾ Yd. Shovel front for Model 41 Lorain

All this equipment in excellent operating condition and can be seen at work in South Alabama.

McDOWELL & McDOWELL CONTRACTORS
P. O. BOX 1144
NASHVILLE, TENNESSEE
PHONE AL 5-0304

COMPLETE CONCRETE PLANT

1—Complete concrete plant—175 tons, 4 compartment aggregate bins with 3 yd. batcher, scales and bucket elevator, 600 bbl. cement silo with batcher under track screw conveyor and bucket elevator.

Available immediately.
Located in Colorado.

PHONE OR WRITE:

Memphis Equipment Co.
766 S. Third St. JA. 5-7841
Memphis, Tenn.

FOR SALE
AT ATTRACTIVE PRICES

12—20 cu. yr. Automatic Air Dump Cars

1—35 ton Ohio Diesel Locomotive Crane

1—30-ton Ohio Diesel Locomotive Crane

1—30-ton Plymouth Diesel Locomotive

1—65-ton Porter Diesel Electric Locomotive

All Equipment in Excellent condition.

HYMAN-MICHAELS COMPANY
108 North State Street Chicago 2, Illinois

TURNAPULL-D ROADSTER
GMC Diesel. Good Condition.
Priced to Sell
ANDERSON EQUIPMENT COMPANY
P. O. Box 1737 Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

Assistant To

SUPERINTENDENT of MAINTENANCE

To eventually become Supt. of Maintenance Engineering Degree and Practical Experience Preferred

Responsible for: all mechanical maintenance of two plants including supervision of machine shop, storage of supplies and other related work.

SALARY OPEN — COMPANY HAS GROUP INCENTIVE PAY PLAN

All replies will be treated confidentially and should include age as well as details of education, health, previous work experience and reason for desiring change.

PEERLESS CEMENT CORPORATION
1144 Free Press Bldg. Detroit 26, Mich.

INDEX TO
Broadcast Advertisers

Anderson Equipment Co. 186, 187, 188, 190, 191

Bailey Production Corp. 184
Basic Incorporated 188
Bichler Brothers, Gravel 184
Big Bend Collieries, Inc. 187
Beemsterboer, Sam 186
Bonded Scale & Machine Co. 185
Brandeis Machy. & Supply Co....183, 189
Braxos Valley Sand & Gravel Co....190
Brill Equipment Co. 184
Brown-Strauss Corp. 184
Burgess, A. E. 189

Campbell, Sons' Corp., Harry T. 186
Carlyle Rubber Co. 189
Chapin Cylinder Head Co. 186
Construction & Power Machy., Inc....184
Corbisello Quarries 187
Corson, Inc., G. & W. H. 189

Dakota Sand & Gravel Co. 186
Dolese & Shepard Co. 186

Ehrbar, Inc., Edward 188
Eighmy Equipment Co. 188
Electric Equipment Co. 184
Electric Service So. 190
Equipment Corp. of America 188

Foster Co., L. B. 188
Frank, M. K. 187

Gelb & Sons, Inc., B. 188
Gibbs Cook Equipment Co. 186, 190

H & P Machy. Co. 186
Heat & Power Co., Inc. 190
Heidenreich, Jr., E. Lee 183
Hewitt-Robins, Inc. 183
Hyman-Michaels Co. 191

Irving Materials, Inc. 187

Land, Inc., L. J. 189
Lefton Industrial Corp. 184
Lubrecht, III, Wm. 184

Machinery & Equipment Co., Inc.....187
Machinery Reserve of Denver 189
Mahoney-Clarke, Inc. 189
McDowell & McDowell, Contractors..190
Meissner, Inc., John F. 183
Memphis Equipment Co. 190
Mid-Continent Equip. Co., Inc. 190
Mine & Mill Equipt. Corp. 184

New Jersey Drilling Co. 183
Nussbaum Electric Co. 188

O'Neill, A. J. 190

Pittman Tractor Co., J. D. 189
Peerless Cement Corp. 191
Pennsylvania Drilling Co. 183
Perkoski, J. H. 187
Perry Equipment Corp. 187
Power Equipment Co. 189

Radcliff Gravel Co., Inc. 184
Reynolds & Son, Inc. 189

Scott's Welding & Mach. Shop 187
Smith, Inc., L. B. 186
Smith, Co., H. Y. 186
Stanhope, Inc., R. C. 187
Swabb Equipment Co., Inc., Frank....188

Terteling & Sons, Inc. 189
Thomasville Drilling & Testing Co....183
Tractor & Equipment Co. 184
Troyer Equipment Co. 186

Unverzagt & Sons, G. A. 188

Walkden Sand & Gravel Co. 184, 188
Wenzel Machinery Co., Inc. 190
Whisler Equipment Co. 187
Williams Construction Co. 187
Wyandot Blacktop Co., Inc. 188

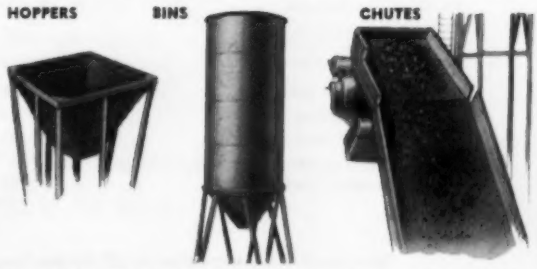
ADMIRO...for Peak Resistance to SHOCK, WEAR, ABRASION

YOU NEED ADMIRO Heat Treated High Tensile Alloy Steel to insure maximum service life for equipment subjected to hard usage. ADMIRO greatly reduces the effect of impact and abrasion. It cuts costly equipment down-time—shows record economies in repair and maintenance.

COMPLETE FABRICATING FACILITIES
Welding — Rolling — Forming
Intricate Shapes Cut to Specification

Recommended Applications: Relining and repairing truck beds, crushers, buckets, wear liner plates, dirt and rock recovery equipment. Special uses in Mining, Quarrying, Cement and Aggregate Plants.

HOPPERS BINS CHUTES



Write for Bulletin
ADMIRAL ALLOY STEEL CORP., 850 Euclid Ave., Cleveland 14, Ohio
ADMIRAL ALLOY STEEL CORP. of Texas, 2802 Rector St., Dallas 15, Texas

Index to Advertisers

A

Admiral Alloy Steel Corp. 191
Ajax Flexible Coupling Co., Inc. 154
*Allis-Chalmers Mfg. Co. 13, 110-111, 177
*Allis-Chalmers Mfg. Co. Construction Machinery Division 61, 118
American Chain & Cable Co., Inc. Automotive & Aircraft Division 160
*American Manganese Steel Div., American Brake Shoe Co. 8
*American Steel & Wire Div., U.S. Steel Co. 44-45
Anaconda Wire & Cable Co., Sub. of Anaconda Copper Mining Co. 195
Athey Products Corp. 159
Atlas Powder Co. 94
Austin Powder Co. 42
Austin-Western Company 193
Autocar Division, White Motor Co. 18-19
Automotive & Aircraft Division, American Chain & Cable Co., Inc. 160

B

*Babcock & Wilcox Co. 74-75
Baldwin-Lima-Hamilton Corp., Construction Equipment Div.—Lima Works 193
*Barber-Greene Co. 169
*Bemis Bro. Bag Co. 66
Black Bros. Co., Inc. 171
Broadcast Section 183-191
*Brunner & Lay, Inc. 62
Bucyrus-Erie Company 155
Buffalo Forge Co. 72

C

Carolina Tire Co. 165
Caterpillar Tractor Co. 87, 147
Chevrolet Division, General Motors Corp. 69
Chrysler Corporation 105-106
Cities Service Oil Co. 157
Cleveland Vibrator Co. 158
*Colorado Fuel & Iron Co. 163, 179
*Combustion Engineering, Inc., Raymond Division 20
Construction Equipment Div.—Lima Works, Baldwin-Lima-Hamilton Corp. 193

D

Dayton Rubber Co. 78-79
*Denver Equipment Co. 3
Detroit Diesel Division, General Motors Corp. 93
Dodge Truck Division, Chrysler Corp. 105-106
*Dorr-Oliver, Inc. 102
Du Pont de Nemours & Co., E. I. 47, 162

E

*Eagle Crusher Co. 53
*Eagle Iron Works 25
Eimco Corporation 151
Euclid Division, General Motors Corp. 65
Extremultus, Inc. 172

F

*Falk Corporation 21
Farval Corporation ..... Inside Back Cover
Ford Motor Co., Tractor & Implement Division 33-36
*Fuller Company 28-29, 148

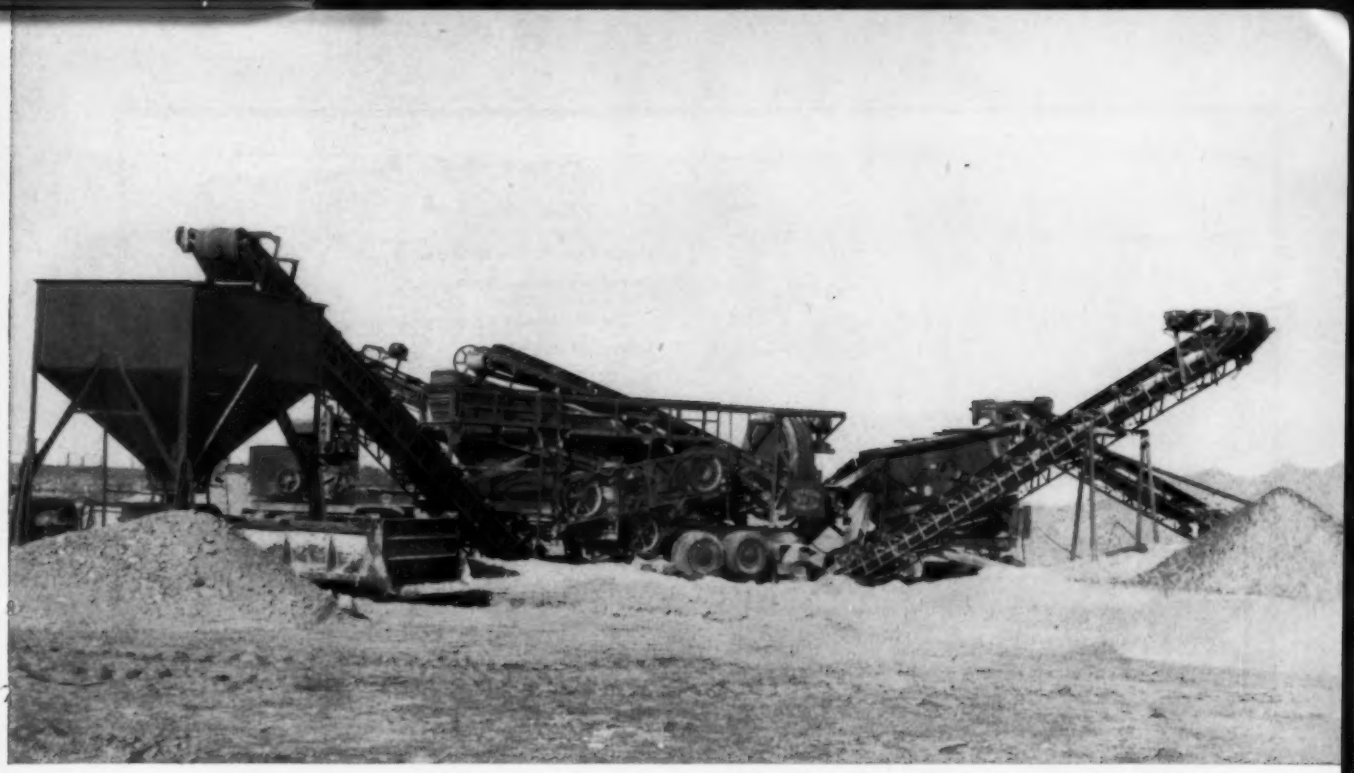
G

Gardner-Denver Co. 138
*Gates Rubber Co. 131
*General Electric Co. 14-15, 70-71
General Motors Corp. 65, 69, 93
*General Refractories Co. 143
Goodrich Industrial Products Co., B. F. 196
Goodyear Tire & Rubber Co. 7

H

H & L Tooth Co. 171
*Hardinge Co., Inc. 4
*Hendrick Mfg. Co. 171
Hendrix Mfg. Co., Inc. 176
*Hewitt-Robins 168
Heyl & Patterson, Inc. 30
Hough Co., Frank G. 135
Howe Scale Co. 166

*See also Detailed Information in 1957 Pit and Quarry HANDBOOK and CONCRETE INDUSTRIES YEARBOOK.



Portable A-W plant producing base material for large state highway job near Los Banos, California.

AUSTIN-WESTERN Crushing Plant produces rock at low cost for Richards-Underdown Co., Fresno, Cal.

High output and low cost—that's the story on the Austin-Western 101-S Crushing Plant working for one of the biggest producers in the San Joaquin Valley. Despite its large capacity, it can be moved easily and fast from job to job.

In the operation shown above, feed material is scalped ahead of the crushing plant to remove fines and produce minus $1\frac{1}{4}$ inch material. Feed over the scalper goes to the primary crusher, which has a 1036 jaw. It then passes into the big 30 x 20 inch roll crusher, which turns out a $\frac{3}{4}$ inch plant-mix material. The plant has three conveyors, which deliver sand and road-base material in sizes of 1 inch and minus $\frac{3}{4}$ inch.

The plant is powered by a 62.5 kva generator, driven by a diesel engine. The individual motors operate the conveyors and the scalping screen through short-coupled V-belts—there are no idlers, clutches, etc., to cause mechanical loss. The crushing plant itself is direct-diesel-driven by a propeller shaft. A single convenient push button station controls the entire closed-circuit system.

There's a high-speed, profit-making Austin-Western Plant exactly right for your needs. Call on your nearest distributor for full information. Or write Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Lima, Ohio.

COMPARE—AND YOU'LL WANT AN AUSTIN WESTERN CRUSHING PLANT

1. *Welded steel plate frame for high strength without weight of cast steel frame.*
2. *Machined steel toggle plate for absolute protection, instead of cast iron.*
3. *Inclined positive-throw-type vibrating screen.*
4. *All moving screen parts operate in rubber bushings that need no lubrication.*
5. *Dual rear wheels for added stability; fully enclosed brakes on rear tandem.*
6. *Oversize self-aligning spherical bearings in crusher.*
7. *Heat treated chrome vanadium steel shaft in crusher.*

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

AUSTIN-WESTERN
CRUSHING, SCREENING AND WASHING EQUIPMENT

BALDWIN BLH LIMA-HAMILTON

BALDWIN-LIMA-HAMILTON
Construction Equipment Division — LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation
Hamilton • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works

I

International Nickel Co. 175
*Iowa Manufacturing Co. 167

J

Jeffrey Mfg. Co. 6

K

Kaiser Aluminum & Chemical Corp. 16-17
*Kennedy-Van Saun Mfg. & Engrg. Corp 50-51
Koehring Company 58-59

L

LimiTorque Corporation 49
*Link-Belt Company 1, 67
Link-Belt Speeder Corp. 80-81
*Ludlow-Saylor Wire Cloth Co ..... Inside Front Cover
Lukens Steel Co. 22

M

Moline Malleable Iron Co. 180
Monsanto Chemical Co. 109

N

National Crushed Stone Assn. 181
National Ready Mixed Concrete Assn. 178
National Sand & Gravel Assn. 178
New York Engineering Co. 46
*Nordberg Manufacturing Co. 41
Northwest Engineering Co. 5

O

Olin Mathieson Chemical Corp.,
Ramset Fastening System,
Winchester-Western Div. 127

P

*Pettibone-Mulliken Corp. 63
Philadelphia Gear Works, Inc. 49
Porter Company, Inc., H. K. 64
Preco, Inc. 170

Q

Quaker Rubber Div.,
H. K. Porter Company, Inc. 64

R

Radio Corporation of America 43
Ramset Fastening System,
Winchester-Western Div.,
Olin Mathieson Chemical Corp. 127
*Raymond Bag Corp. 165
*Raymond Division,
Combustion Engineering, Inc. 20

S

*Sauerman Bros., Inc. 164
Schaffer Poidometer Co. 156
*Screen Equipment Co. 97
Shell Oil Co. 149
Sinclair Refining Co. 101
SKF Industries, Inc. 141
*Smidth & Co., F. L. 11
*Smith Engineering Works 38-39
Southern Tire Co. 48
Spencer Chemical Co. 173
*Stephens-Adamson Mfg. Co. 121
Straub Mfg. Co. 117
Stulz-Sickles Co. 153
*Syntron Co. 9

T

Texas Company ..... Outside Back Cover
Thew Shovel Co. 161
*Traylor Engrg. & Mfg. Co. 174

U

*United States Steel Co. 44-45, 55
*Universal Engineering Corp. 63
*Universal Vibrating Screen Co. 73

W

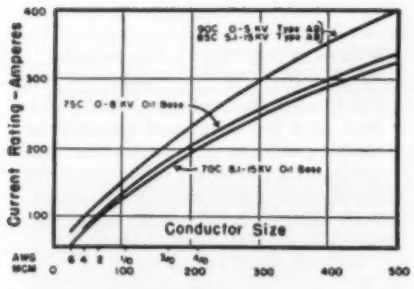
*Western Machinery Co. 56, 57
White Motor Co.,
Autocar Division 18-19
Whitmore Mfg. Co. 152
*Williams Patent Crusher & Pulverizer Co. 77
*Wood Co., Chas. E. 165

*See also Detailed Information in 1957 Pit and Quarry HANDBOOK and CONCRETE INDUSTRIES YEARBOOK.

PHOTO COURTESY OF HARNISCHFEGER CORP.

Anaconda butyl-insulated Shovel Cable powers 5-cu.-yard electrical shovel in Inspiration Consolidated Copper Co. mine.

New cable insulation stops heat failures cold!



85C and 90C operating temperature rating of Anaconda Type AB insulation is compared to lower ratings of ordinary insulation.

Shovel cables are running hotter today! Shovels are bigger. Loads are heavier.

With these tough new conditions, it is no wonder more and more mine operators are turning to Anaconda Shovel Cable insulated with Type AB butyl insulation.

This insulation has *inherent* resistance to heat. It stops cable failures due to heat—cold! In addition, Type AB insulation is tougher, resists moisture and ozone, and has high dielectric strength.

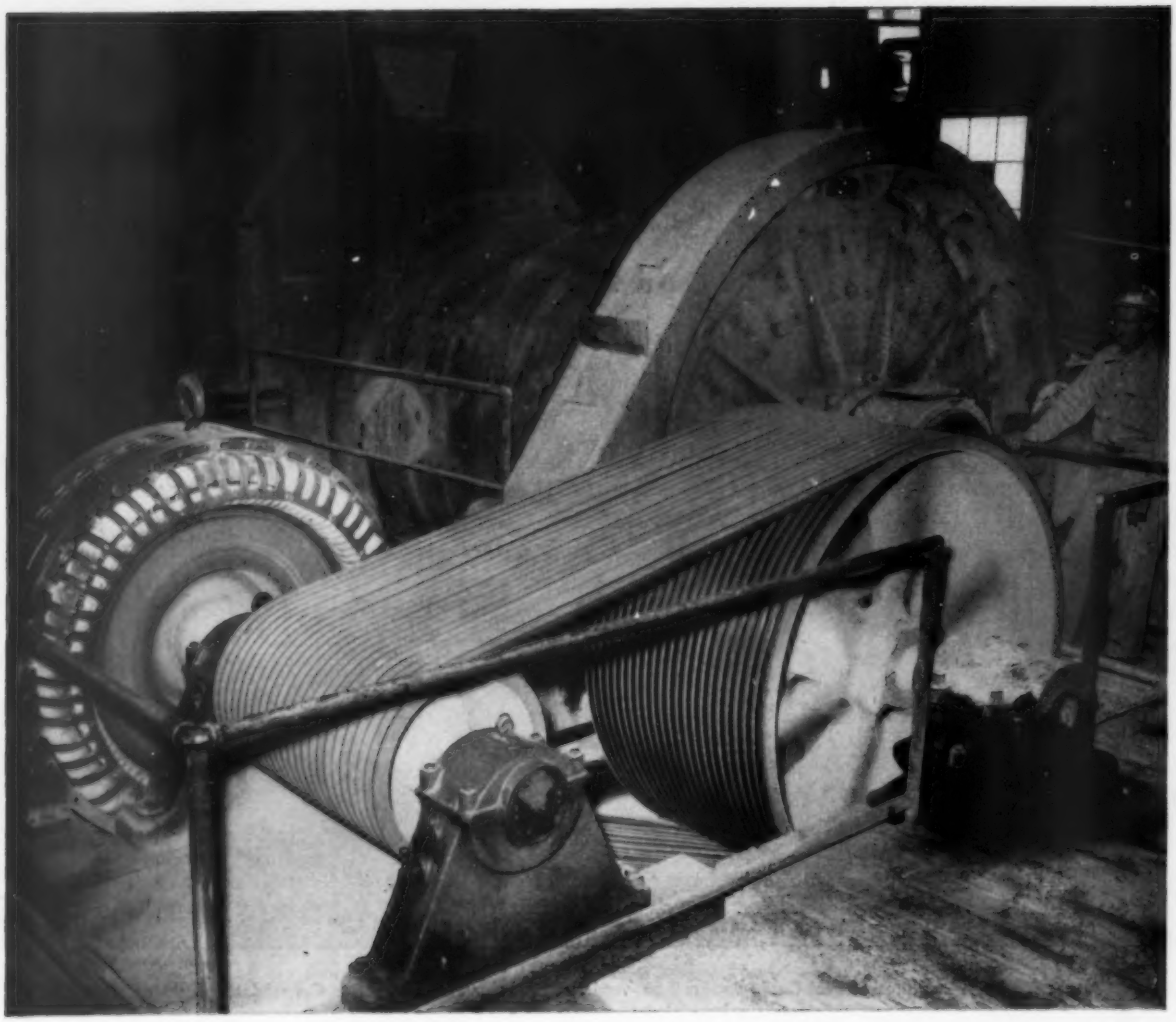
Neoprene jacket, too, is extremely tough and abrasion-resistant. Patented rubber cores cushion the ground wires and help prevent breaks.

For Shovel Cable or more information, call the Man from Anaconda or see your Anaconda distributor. Write for Type AB Bulletin EB-27. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y. 57817

SEE YOUR ANACONDA®

DISTRIBUTOR FOR SHOVEL CABLE

B.F.Goodrich report:



Big steel gizzard grinds rocks

B. F. Goodrich improvements in rubber brought extra savings

Problem: As long as that big steel drum (at left) keeps turning, it does a beautiful job of grinding copper ore into powder. Hundreds of steel balls do the grinding, just as pebbles in a chicken's gizzard pulverize food.

But getting that heavy mill to turning from a dead stop, sometimes snapped one or more V belts like pieces of string. Even after starting, the strain of keeping it going wore out belts before their time.

What was done: When a B.F.Goodrich distributor heard of the problem, he recommended Grommet belts, a different kind of V belt developed and made only by B.F.Goodrich. On the outside a Grommet belt looks like any other V belt. But buried inside are two cord loops, made like twisted cables except that they're endless—no splices or overlaps. It's these two grommets that make the B.F.Goodrich belt strong enough to pull heavy loads and take sudden jerks without going to pieces.

Savings: The set of B.F. Goodrich belts shown above have been on the job nearly 6 years now—longer than any V belts used before—and they show no signs of wearing out. They've never needed to be adjusted, haven't lost a minute of the copper company's time.

Where to buy: Your B.F.Goodrich distributor has full information on the B.F.Goodrich belts described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-212, Akron 18, Ohio.*

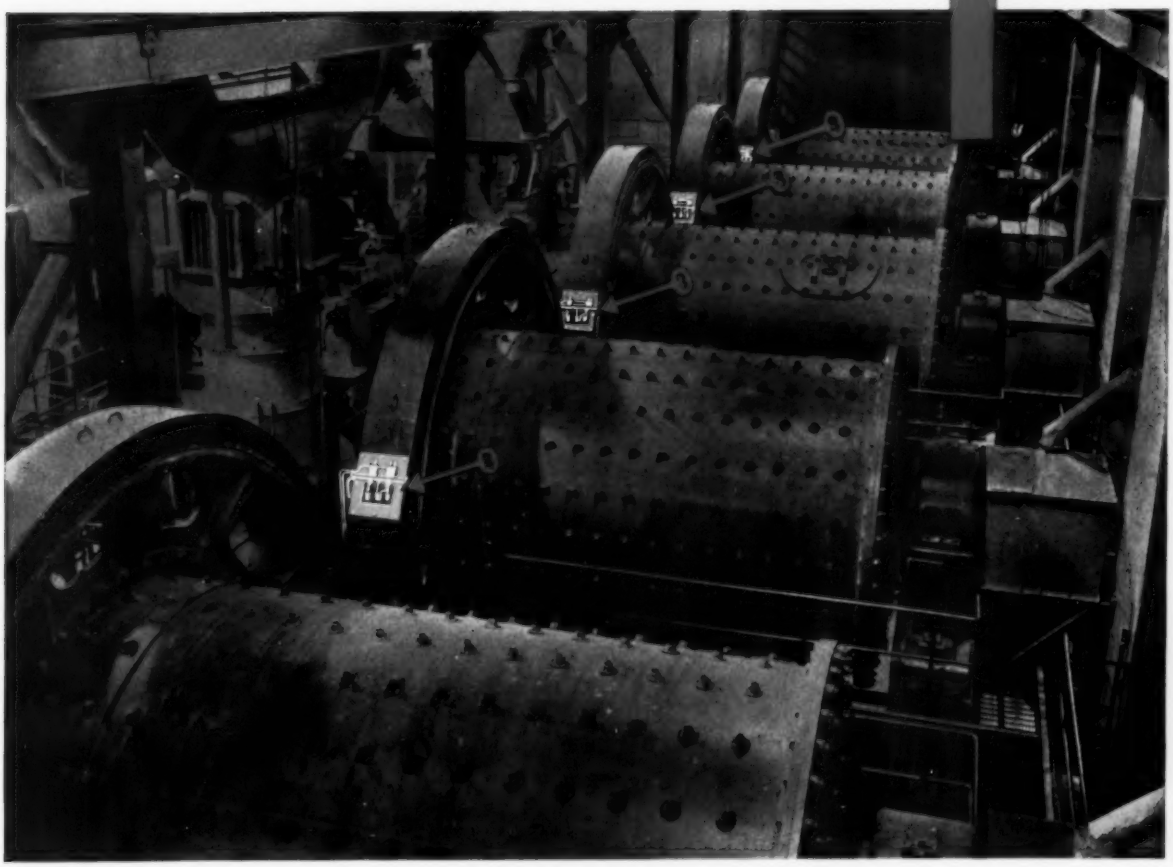
Grommet—T. M. The B. F. Goodrich Co.

B.F.Goodrich

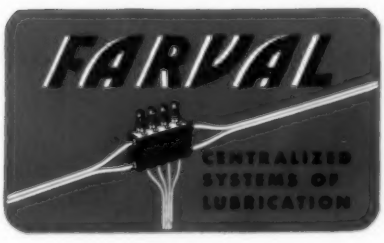
INDUSTRIAL PRODUCTS

Gears of 5 grinding mills and 4 kilns lubricated by Farval spray valves

FARVAL—
Studies in Centralized Lubrication
No. 184



KEYS TO ADEQUATE LUBRICATION—
Wherever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated. Photograph shows the Farval spray valves installed on the mills at the Dragon plant.



● Stressing safety, simplicity and easy maintenance, the Northampton, Pa., plant of Dragon Cement Company is an excellent example of accomplishments through use of automatic devices. Full scale operation of all mills and supplementary equipment in the Grinding Department requires only 4 men—miller, man on the air separator floor, scale man and a laborer.

Farval Spray Valves automatically lubricate the large gears on the 5 grinding mills as well as those of the 4 cement kilns—working quietly and efficiently in eliminating downtime for hand oiling, saving excess oil formerly wasted.

Farval Spray Valves can be installed individually, or as part of a standard Dualine system of centralized lubrication. Farval delivers oil or grease under pressure to bearings, gears, sliding surfaces or other areas needing lubrication, from one central station, in exact quantities, as often as desired. Find out how Farval can help you. Write today for Bulletin 60-A. The Farval Corporation, 3280 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm and Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

MORE THAN 650 MILLION POUNDS OF *TEXACO MARFAK* HAVE BEEN SOLD

How to boost yardage in a dust bowl

What causes equipment to "bog down" in a dust bowl? Frequently dust and dirt in the bearings are to blame—something you can easily prevent by lubricating with *Texaco Marfak*.

This world-famous chassis lubricant seals out dust and dirt, seals itself in the bearings, keeps wear at a minimum. And the protection is long-lasting because *Marfak's* tough film stays put even under heavy shock loads. As a result, your equipment stays on the job longer—production goes up.

For a wheel bearing lubricant that provides similar protection against dust and dirt . . . use *Texaco Marfak Heavy Duty 2*. It stays in the bearings and off the brakes. Furthermore, it's an all-season lubricant that permits repacking on an extended mileage basis.

Or you can use just one lubricant—*Texaco Marfak Heavy Duty Special 2*—for chassis, wheel bearing, water pump and other grease lubrication. This lithium-base lubricant stays put in the toughest service, resists water washout and pumps easily at low temperatures.

And to give all kinds of rolls maximum protection from rust and wear . . . use *Texaco Track Roll Lubricant*.

Why not find out exactly how few Texaco products can keep your equipment performing efficiently in any area, under all conditions? Call the nearest of more than 2,000 Texaco Distributing Plants in the 48 States or write The Texas Company, 135 East 42nd St., New York 17, N. Y.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

EUGENE B POWER
UNIVERSITY MICROFILMS
313 N FIRST AVE
ANN ARBOR MICH